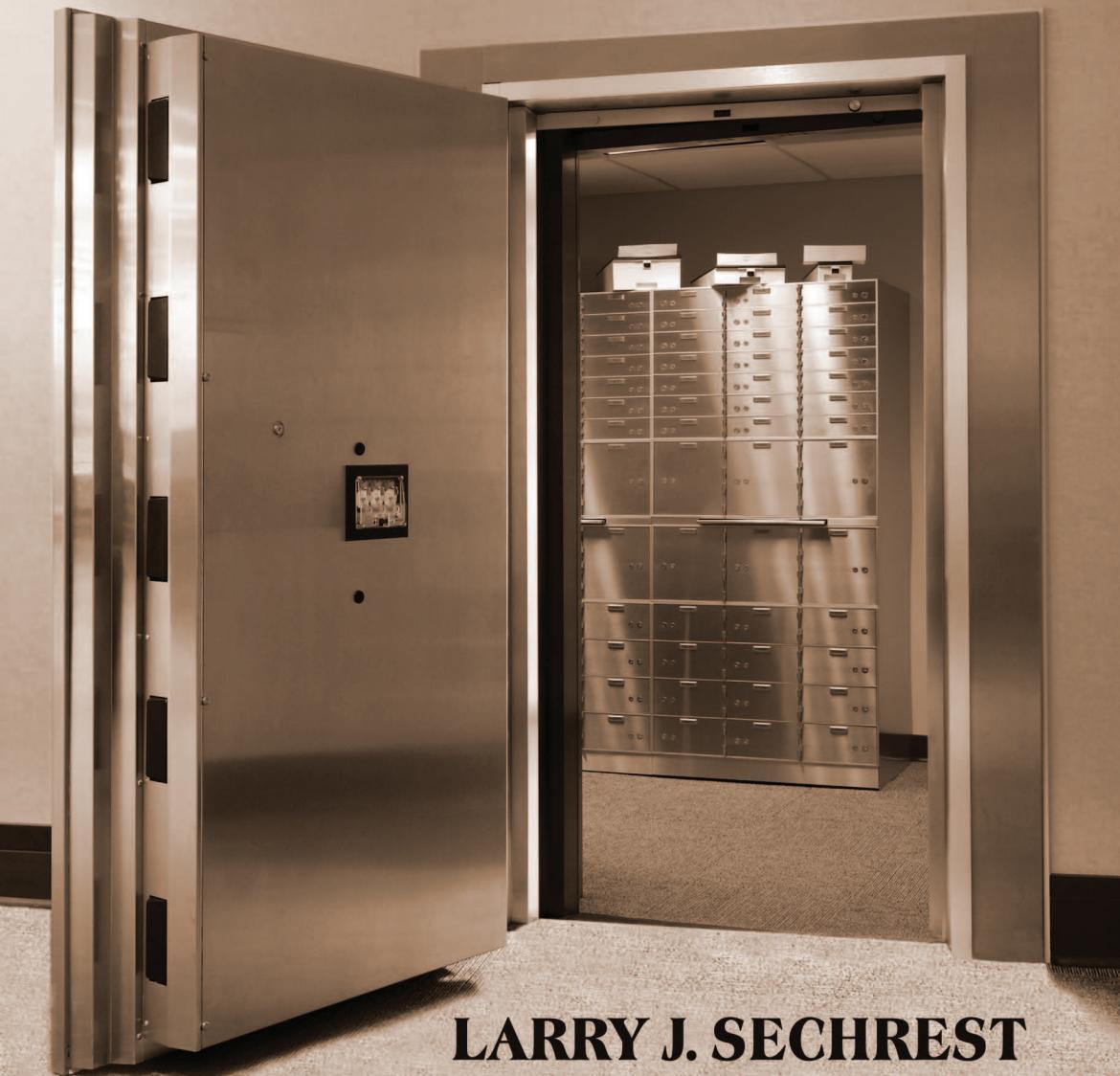


FREE BANKING

THEORY, HISTORY, AND
A LAISSEZ-FAIRE MODEL



LARRY J. SECHREST

Free Banking

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**Theory, History, and a
Laissez-Faire Model**

LARRY J. SECHREST

Foreword by Kevin Dowd

The Ludwig von Mises Institute
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To Ayn Rand, Murray Rothbard, and F. A. Hayek
For the inspiration

To Henry G. and Raechel Raish
For the love and support

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PREFACE TO NEW PRINTING

After the first edition of this book appeared in 1993, I turned away from many of the banking issues explored herein. Anarchocapitalism, taxation, and public goods in maritime history occupied most of my professional attention, while at the same time there was an ongoing personal project, a 1300-page manuscript analyzing merchant sailing ship performances, on which I have been working for some 20 years. I continued to think and write about business cycles, but largely left free banking behind. This was because I thought that the case for fractional reserve free banking based on a commodity “outside” money had been persuasively presented by myself and others such as Lawrence H. White, George Selgin, and Kevin Dowd. And I still do.

However, one group of economists has continued to reject and attack laissez-faire banking, at least so long as such banks are based on the holding of less than 100 percent (primary) reserves. This group is principally composed of certain Rothbardians associated with the Ludwig von Mises Institute, some of whom, by the way, I am pleased to think of as friends. It includes, among others, Walter Block, Jörg Guido Hülsmann, Hans-Hermann Hoppe, William Barnett II, and especially Jesús Huerta de Soto. In what follows I will explain why I think their various condemnations of fractional reserve free banking (FRFB), despite their energetic efforts, remain unconvincing.

Allow me to begin with the last, Huerta de Soto. His massive 876-page treatise, *Money, Bank Credit, and Economic Cycles* (2006), is intended to be the final and decisive proof that fractional reserves are incompatible with a) a proper defense of private property rights, b) morality, and c) a stable economy. With painstaking effort he investigates legal theory, banking history, business cycles, and even variations in medieval theological doctrine. There is much to interest the curious reader, but a great deal is actually irrelevant to the author’s professed intent. Further, one will repeatedly encounter, along with some careful scholarship, “straw man” arguments, nonsequiturs, and question-begging. Pervading the

early portions of the work is the assertion that ancient Roman law, and medieval European law based upon it, correctly identified the true nature of demand deposits (“monetary irregular deposits”) as warehouse contracts involving fungible goods (though he seems strangely unaware that commodity coins have often not been fungible due to debasement, or normal wear and tear). Any deviation from such contractual relations (e.g., fractional reserves) he thus castigates as an act of fraud or theft on the part of the banker. If that sounds as if the book adopts a severely moralizing tone, it does. In fact, there is use of the term “sin” when reviewing various episodes in banking history (pp. 88, 92, 97). And fractional reserve depositaries are even described as “legal aberrations” possessing no legal standing, much like human “monsters” with physical deformities (p. 143). Moreover, Huerta de Soto insists that banks indulging in fractional reserves inevitably open the Pandora’s Box of monetary inflation, excessive credit creation, malinvestment, and business cycles (pp. xxvi, 56 n32, 265–395).

He does recognize that loans (*mutuum* contracts) are also legitimate, but at the same time insists that all loans must be for a stated time period. Amazingly, Huerta de Soto declares that loans devoid of such a time stipulation “cannot exist” (pp. 3–4). And yet they do exist. Prepayment options are common today in both mortgage contracts and tuition loans to college students. At a number of points elsewhere in the book, he claims that throughout history the principal, if not the only, reason for bank failures and bank runs has been fractional reserves. Here he ignores two crucial facts: a) bank failures have often been the result of constraining regulations and/or errors in granting loans and b) during bank runs, consumers have often shifted their checkable deposits from an insolvent fractional reserve bank to some other, *solvent* fractional reserve bank—instead of simply holding greater amounts of cash, either at home or in a safety deposit box. It is precisely this sort of faulty reasoning, born of a plausible premise but impervious to the facts, which will justifiably fail to persuade many economists.

In effect, Huerta de Soto *defines* demand deposits as a warehousing contract and then proceeds to provide many details on how that sort of contract has often been violated by banks. He never really comes to grips with the nature of FRFB, nor with its defenders’ arguments (though he attempts to do this in his Chapter 8). This book chronicles many episodes in banking history, but the conclusions that are drawn are highly dependent upon the assumptions from which they commence. For example, a speech given by Demosthenes in 362 B.C. is discussed at some length in order to glean an understanding of ancient Greek banking. However, when Demosthenes declares that the main reason for bank failures was the extension of credit to unworthy borrowers, Huerta de Soto suddenly parts company with him, insisting that he is “mistaken” since the real reason for such failures was bankers’ failure to hold 100 percent reserves (pp. 48–49). Similarly, after favorably citing works by scholars Ramon Carande, Abbott P. Usher, and Raymond De Roover, he asserts that they all have misinterpreted the historical

evidence insofar as they fail to dwell on what he would, no doubt, describe as the egregious fraud of fractional reserves (pp. 71 n56, 74, 81).

While discussing theorists of the famed School of Salamanca, he concedes that some actually favored fractional reserves, but these he dismisses as being Jesuit “deviationists” (p. 95, n97). He does of course praise those Dominicans of Salamanca who, he believes, were advocates of 100 percent reserves. However, it is not entirely clear from the citations provided whether these Dominicans’ criticisms were actually aimed at fractional reserves *per se* or at “usurious” loan contracts between bankers and their customers (pp. 85–88). In fact, he comes rather close, though unintentionally, to conceding the latter (p. 89).

There are also some rather far fetched connections that Huerta de Soto is willing to use as “evidence” in his favor. One particularly notable example has to do with his judgment of the operations of Spanish banks during the sixteenth century. Here he depends largely on the work of Carlo M. Cipolla regarding *Italian banks* of that same time period. Amazingly, Huerta de Soto reassures the reader that the details on Italian banks are “directly applicable” to Spanish banks because of the close economic ties between the two nations (p. 81). I would grant that banking practices in one nation might mirror those in another nation, but I would need more of an explanation than the mere assertion that the two economies were, in certain ways, interdependent. Great Britain and the United States have been linked economically for a long time, but does that justify the conclusion that any analysis of American banking practices would be equally applicable to Britain?

The foregoing indirectly brings to mind a further possible problem for the reader, though not necessarily a flaw in the presentation. Huerta de Soto is obviously multilingual, which is entirely to his credit of course. His sources include ones which are in English, Latin, Spanish, Italian, and French. However, any reader fluent in only one of those languages—and who might have reservations about Huerta de Soto’s evidence—must be left with the nagging question of whether certain of the cited sources actually do support the book’s arguments.

Above all, Huerta de Soto refuses to even consider the possibility that banks’ customers may have been quite willing to face some risk exposure in exchange for the benefits of a) the receipt of interest on their deposits and b) having circulating inside money in the form of “payable to the bearer” banknotes (something 100 percent reserve banks are unable to provide, since they must charge security fees on all demand deposits). Instead, he is driven to a heavily conspiratorial interpretation of banking history. In his hands any departure from 100 percent reserve banking is *automatically* taken to be evidence of malfeasance by bankers, even when there is no clear data on the details of the contractual relations negotiated by depositors. “[T]he traditional principles of safekeeping on which the monetary irregular-deposit contract is based were violated from the very beginning [of banking] in a concealed manner. . . . [Governments] supported bankers’ improper activity almost from the beginning” (pp. 37–38). This may accord with

Murray Rothbard's view of the political class as some sort of unrepentant cabal, but it sheds rather little light on the essence of banking.

A clever variation on this same theme of fractional reserve banking as fraud can be found in Jörg Guido Hülsmann's article "Has Fractional-Reserve Banking Really Passed the Market Test?" (*The Independent Review*, Winter 2003). The novelty here is the argument that the "IOUs" of fractional reserve banks (their issues of banknotes and deposit credits) are naturally differentiable due to the varying risk characteristics of each bank, and thus such fiduciary instruments will vary in price, with all being traded at a discount relative to real money (specie) and money titles (notes issued by 100 percent reserve banks). To overcome this problem, Hülsmann claims that FRFB will unavoidably gravitate toward forming a cartel in which all individual banks agree to "homogenize" inside money by accepting one another's IOUs at par. Their goal is to accomplish the "semantic trickery" (p. 411) of deceiving the public into thinking that the banknotes or deposit credits issued by fractional reserve banks are no different from money or money titles.

There are two flaws in this argument. First, if the cartel is voluntary, it will have little chance of surviving. As Murray Rothbard pointed out in *Man, Economy, and State* (pp. 579–86), such cartels are inherently unstable. They either revert to a multiplicity of competitors or merge into one large firm. If we are to take Hülsmann's hypothesis seriously, then it is incumbent upon him to explain why cartels are generically unstable, but somehow stable in the context of fractional reserve banking. On the other hand, if compulsion is involved, what one has is the imposition of a central bank on the economy. The former case is ineffective, and the latter has no relevance to the case for FRFB.

Second, Hülsmann apparently wants the reader to believe that consumers are somehow steadfastly incapable of differentiating a) money warehouses which issue money titles and charge their customers fees for the provision of security (and perhaps transaction services such as accounting entries which transfer funds from one customer to another) from b) financial intermediaries which issue their own distinctive inside money ("IOUs"), offer transaction services, and pay interest on their customers' account balances. In fact, he even claims that Gresham's Law becomes operative in this environment (p. 408). That is, he insists that the "overpriced" IOUs tend to drive the "underpriced" money titles out of circulation.

One immediate problem with this is that, as Murray Rothbard stated emphatically (*Man, Economy, and State*, p. 783), Gresham's Law only applies to the case where one form of money is *officially* overpriced and the other *officially* underpriced, that is, by an *act of government*. It does not apply to free market relationships. A further, obvious inconsistency is revealed as soon as the reader recalls that these selfsame bank customers are allegedly able to differentiate among the IOUs issued by various fractional reserve banks (based on the variation in risk) and simultaneously unable to tell the difference between a fractional reserve IOU

and a real money title issued by a 100 percent reserve bank warehouse. This is nonsensical. It seems comparable to claiming that a person can differentiate among the numerous breeds of dogs, but cannot tell that a cat is not a dog.

Allow me now to leave aside further specific criticisms of particular works and instead to emphasize certain commonalities. Found in both of these above-mentioned essays, and most if not all, other defenses of 100 percent reserve banking are three problematic assertions. The first is the assumption that any departure from 100 percent reserves *cannot* be agreeable to the bank's customers and thus constitutes an act of fraud on the part of the banker. As a result, all the historical episodes in which banks began as money warehouses but later acted as intermediaries holding fractional reserves are immediately interpreted as being rooted in criminality. The obvious alternative possibility, that fractional reserve holding might have naturally evolved as an *improvement* on warehousing is rejected out of hand. This mode of thinking extends to court cases. Any judge who ruled that interest-bearing demand deposits were a form of loan to the banker becomes an accomplice to fraud. The idea that such a ruling might have accurately reflected a common practice, one generated by the fully-informed and voluntary actions of both banker and depositor, is never investigated seriously.

The second troubling premise is the notion that, once there exists an accepted medium of exchange used by all in a given society, no changes in the money stock are ever welfare-enhancing. In other words, at that moment the existing supply is already optimal. Neither subsequent increases nor subsequent decreases serve any valid economic purpose (other than those deflationary decreases which are the corrective for prior inflationary increases). That having been said, they do not quite mean literally *all* changes in the money supply. Increases in banknotes or deposit credits which stem from an increase in the monetary gold held in the vaults of the 100 percent reserve banks are seen as natural and harmless. And they often note that such increases in the specie base have occurred historically at modest annual rates of 1 percent–5 percent.

This proposition faces a serious difficulty. It can only be correct if it is true that the purchasing power of a given money stock adjusts immediately to reflect changing conditions, i.e., all prices must be perfectly flexible in the short run. And I have long found that latter condition to be highly questionable. Indeed, it flies in the face of certain crucial aspects of Austrian thought. For instance, all Austrians describe the market as comprising interactions between forward-looking (i.e., speculative) buyers and sellers whose state of knowledge is always incomplete, even as they strive for completeness. Moreover, this state of knowledge is ever-evolving precisely because the market is a *discovery process*. But to discover economic facts requires time. It cannot be anything close to instantaneous. And it cannot be devoid of error. Therefore, to conceive of the market as a discovery process is to cast doubt upon the idea that all prices are fully and rapidly flexible. Those who maintain that any supply of money is “optimal” seem, in

effect, to live in the long run world of full equilibrium, not the real world of constant adjustments and corrections.

Further doubt is raised as soon as one tries to integrate full and rapid price flexibility with the Austrian theory of business cycles (ABCT). This probably cannot be done in any plausible way. ABCT is a theory of unsustainable booms—followed at some point by inescapable contractions—which are fueled by excessive credit expansion undertaken by the central bank. Relative prices and the market rate of interest are modified in a way that is inconsistent with consumers' time preferences. These monetary effects are far from trivial because they elicit changes in *real* factors, in particular, changes in the capital structure. In striking contrast to mainstream macroeconomists, who usually ignore all issues of the capital structure (and thus focus on either short run disequilibria or on full, long run equilibrium), Austrians wisely emphasize the *medium* run. This is a time period long enough for a restructuring of capital to take place, but too short for the resulting malinvestment to be both recognized and corrected.

Money and credit precipitate the problem; while time-consuming alterations in capital are its manifestation. Furthermore, if the array of relative prices were to be disrupted only briefly, then the capital budgeting errors that are later identified as malinvestment would be much less likely to occur in the first place. If longer-term projects were planned, but then relative prices quickly changed back so as to reveal them to be errors, many projects would never be undertaken at all, and others soon thereafter would be liquidated. The unsustainable boom would never really get underway at all. Once again, some passage of time is needed. There must be time to plan capital projects, time to put those plans in action, time during which the deceptive market signals continue to reassure entrepreneurs that their projects are justified, time for the temporal malinvestment eventually to reveal itself. ABCT deals not with the artificial world of perfect competition, perfect knowledge, and an infallible auctioneer, but with the real world of strategic action, imperfect knowledge, and fallible entrepreneurs. ABCT would appear to require that money has powerful, but sometimes sluggish, effects on prices.

The third problem area is a derivative of the issue of price flexibility discussed above. It is the implicit assumption that the *demand* for money is, in effect, irrelevant to a proper analysis of banking. Led by Murray Rothbard, various Austrians have addressed a question which will inevitably be asked of any advocate of 100 percent reserves: What happens if the demand for money rises or falls? According to these Austrians, a change in the demand for money does not justify a commensurate change in the supply of money. With a given nominal supply of money, if the demand rises (falls) all that will occur is that the purchasing power of money (the inverse of the array of goods' prices) will rise (fall). No adjustment to the nominal stock of money is needed, so 100 percent reserve holding by banks creates no difficulty. Perfect price flexibility allegedly ensures that the *real* money stock adjusts in the appropriate direction. If that line of reasoning is correct, then why does this not work equally easily on the other side of the

market? That is, with a given nominal demand for money, if the nominal supply of money rises (falls) why is the corrective not “simply” a fall (rise) in the purchasing power of money?

As questionable as the foregoing perspective is, no short-run alternative solution would seem to exist for the proponent of 100 percent reserves. Thus, in the absence of perfect price flexibility for all goods and services, both inputs and outputs, only *fractional* reserve free banks are capable of responding properly to changes in the demand for money. Chapters 2 and 3, plus portions of Chapters 4 and 8, of the present work will examine that adjustment process in considerable detail.

I would like earnestly to thank Jeffrey Tucker and the Ludwig von Mises Institute for their willingness to publish this new edition. Whether or not one agrees with the conclusions found herein, I believe that it offers a valuable survey of many of the historical and theoretical issues surrounding laissez-faire banking. Therefore, I hope that one of its uses may be as a supplemental text in banking or monetary theory courses.

I greatly appreciate the helpful comments I have received from John P. Cochran, Steven Horwitz, Lawrence H. White, George Selgin, and Kevin Dowd, as well as the gracious responses from Jesús Huerta de Soto to certain questions of mine.

Finally, I wish to thank my wife Mary Ann and my son Kyle for their invaluable love and support.

Larry J. Sechrest

June 2008

FOREWORD

Free banking is—or at least ought to be—one of the key economic issues of our time. There is mounting evidence that the monetary instability created by the Federal Reserve—persistent and often erratic inflation, the unpredictable shifts of Federal Reserve monetary policy, and the gyrating interest rates that accompany both inflation and the monetary policy that creates it—have inflicted colossal damage on the U.S. economy and on the fabric of American society more generally. Furthermore, much as the United States has suffered, less fortunate countries have suffered far more. Most of us have watched in horror, for example, as Russia has come out of more than seventy years of Communist misery only to slide now into the abyss of hyperinflation. Unlike some disasters, monetary instability is entirely avoidable, but to avoid it, we need to make sure that the monetary system is built on the right foundations—foundations we are very far from having. On top of these monetary problems, we also observe in the United States how ill-judged attempts to regulate the banking system and protect it from the (grossly exaggerated) danger of runs have spawned a massive apparatus of deposit insurance and regulatory control in the form of the FDIC, the now-bankrupt FSLIC, and a variety of other bureaucracies. These agencies were (ostensibly) set up to protect a banking system that, though weakened by legislative restrictions of various kinds and by misguided Federal Reserve policies in the 1930s, was still relatively strong, and yet they managed to convert that system into a chronic invalid made artificially dependent on the ultimately lethal drug of deposit insurance. In addition to gravely weakening the banking system and destroying much of it in the process, the deposit insurance system also accumulated staggering losses—losses of hundreds of billions of dollars and perhaps more—which it then passed back to the long-suffering federal taxpayer. Politicians and bureaucrats have responded with a series of

largely cosmetic reforms that have accomplished virtually nothing and are nowhere near any realistic solution. Once again, what we need are sound free-banking foundations. We do not have such foundations and are unlikely ever to get them if things continue as they are.

Larry Sechrest's book is therefore a timely contribution to a very important policy debate. It is sad indeed that our political and intellectual leaders have still to learn the most important and most obvious lesson to be drawn from the collapse of communism in the eastern bloc—that central planning does not, and cannot, work. To paraphrase Larry, amidst all the celebration that accompanied the demise of communism and with all that has been written about the problems of central planning, our leaders are still afflicted with the craving to practice it, and they cling to the illusion that though eastern bloc socialism might be dead, they still believe that all is well with central planning in the West. They know that central planning failed in the East, but they learned nothing from that failure, and nowhere is this illusion stronger and more cherished than in the sphere of money and banking. One suspects that part of the reason the illusion is as strong as it is in this area is that even professional economists are by and large still afflicted with the central planning mentality. We do not talk of monetary central planning, of course—we talk of central banking or monetary policy—but the goals are the same even if we prefer to use a less sinister label to describe them. Central banking *is* central planning. Those of us who support free banking find it odd that despite all the failures of central planning—the failures of central planning in the eastern bloc, the failures of monetary central planning in the West, and other failures besides—so many economists still cling to it and refuse to consider free banking as a serious alternative. Most still scoff at the idea and dismiss free banking as inherently unworkable (which it is not). Alternatively, they reject it on the basis that it was tried and failed in the past, an argument that is not only not true, but that also has a very strange logic to it. They point to instances such as the bank failures of the antebellum United States as evidence that free banking has a poor historical record—which, in any case, is a highly questionable interpretation. They then conclude that free banking is inferior to central banking, and lo and behold, they have managed to demonstrate that the modern system of central planning, which has produced far more failures, a much weaker banking system, and massive taxpayer losses into the bargain—a system that is demonstrably inferior by any sensible yardstick—is actually the better system!

Yet as Larry argues, this attitude toward free banking simply will not do. The free-banking position is not easily dismissed, and it is too radical and far-reaching to be sensibly ignored. If the free bankers are correct, as I believe they are, then no amount of tinkering will make much difference to our present monetary and banking problems, and we will never get far with them until we start to base reforms on free-banking principles. If the free bankers are not correct, on the other hand, then it is odd that no one has yet managed to refute the case for free banking and ensure that the errors of this potentially dangerous

point of view are exposed for all to see. Yet instead of either siding with the free bankers or trying to refute them, most monetary economists seem to prefer to ignore the free-banking issue altogether and carry on regardless. One can only suppose they have invested a lot of their human capital into ways of thinking that would have to be ditched if free-banking theory turned out to be correct, and only a few can bring themselves to learn again what they thought they already knew.

Larry Sechrest is one of the few who rise to this challenge without flinching and try, as it were, to put the shattered pieces of monetary economics back together again. There is much in this book to appeal to many different readers. Those interested in public policy, and in monetary and banking policy in particular, will find a very articulate and insightful discussion of policy issues. Undergraduates and postgraduates will find new ideas and clear expositions of many issues that researchers and policy makers are talking about, but that have not yet found their way into textbooks. Researchers—academic economists, monetary historians, students of public policy, and others—will find a variety of theoretical developments, new insights and criticisms of existing work, and new interpretations of the historical evidence.

This volume stands out from the existing literature in a number of ways. Although free banking has a number of supporters, different writers often have very different ideas about what free banking in practice would look like. Most writers also fail to discuss in any detail how their systems differ from each other, and the discussions that already exist are often extremely arcane. The reader who starts on this literature therefore enters a mine field with no real warning. Amongst other things, the author makes a very useful contribution by comparing these various systems and offering assessments of them. Some free bankers think in terms of banks issuing their own inconvertible currencies, whereas others think in terms of free banks issuing convertible currencies of one form or other; some free bankers believe that free banks would aim to stabilize the price level, and others, that they would allow prices to fall with productivity growth; some free bankers see free banks as mutual fund intermediaries, and others as institutions like conventional present-day banks that issue both debt and equity; some believe that free banks would operate on a fractional reserve, others that they would observe a 100 percent reserve ratio, and so on. The student of free banking needs to get acquainted with these issues before getting too far into the literature, and this book in my opinion would be a very good place to start.

It offers, however, much more than an introduction to what other people have written. An issue often touched upon in the free-banking literature, but seldom developed in any depth, is the role of the central bank in creating or aggravating the fluctuations of the business cycle. One finds short discussions here and there, but Larry offers a much more thorough treatment of it, one that breaks ground that others had merely staked out. He also offers new empirical evidence on and new interpretations of the much-discussed historical experi-

ences of “nearly free banking,” if that is what they were, in Scotland and the antebellum United States. He argues that these experiences ought not to be interpreted as laboratory-like experiments of “pure” free banking, and he suggests the delightful metaphor that they are like buildings that were well designed but not actually constructed according to those designs. They therefore ran into problems, but those problems cannot be traced to design faults. The design as such (i.e., free-banking theory) was sound, but the construction (i.e., the particular legislative frameworks in which banks had to operate) was not. He also takes issue with those—such as Lawrence H. White and, to a somewhat lesser extent, me—who have interpreted the Scottish experience as a reasonably good, albeit flawed, example of free banking. It is characteristic of Larry’s intellectual integrity that although he readily admits that it would be nice, from a free-banking point of view, to point to the Scottish experience as a case study of free banking in action, and thus gain an edge over anti-free-banking critics who believe that free banking does not work, yet he simply does not interpret the evidence that way, and he would rather pass up the chance of scoring points against the opponents of free banking than compromise his own scholarship. I do not share his interpretation of the Scottish experience, but I do think this kind of critical reassessment is very important, and I applaud him for it. If nothing else, it helps protect us against the myth-making all too prevalent in monetary economics and the associated danger of imposing our theories too strongly on the data.

In my opinion, Larry’s most important contribution is his analysis of the impossibility of rational monetary central planning. The problem with central banking is not that central bankers are ill-intentioned or incompetent people—my own personal experience suggests that they are quite the contrary—but that the very institution of central banking imposes on those who have to operate the system problems to which no feasible solutions exist. They do not have the information they would need to solve them—they do not have the data, and they do not have the knowledge of what rational expectations theorists like to call the “structure” of the economy. They cannot tell what interest rates “should” be, what monetary target to adopt, and so on, if only because they do not have the information they would need. They try to answer these questions regardless—they feel they have no alternative—and are therefore doomed to failure. If a system with good and capable people still does not work, one must blame the system itself for asking them to do the impossible. The same problems arise, of course, in any system that becomes centrally planned—that is of course why central planning always fails. The solution—the only solution—is always the same, regardless of whether we are talking of the (thankfully) now-defunct Gosplan in Moscow or the Federal Reserve System in the United States: The central planning apparatus must be dismantled, and market forces allowed in to do what no central planner can do in their place.

William Gladstone is reputed to have said that monetary economics was the surest recipe for insanity that he knew of. I am not yet entirely convinced of

that, but I would certainly agree that monetary economics produces more than its fair share of confusion and muddled thinking among those of us who study it. (I speak here primarily of my own experience. I have pulled out my hair and changed my mind on monetary issues far more often than I would care to admit.) Those who produce innovative work in areas such as this are probably even more prone than most to these sorts of problems, and the best any of us can aim for is a good “hit ratio” of valid new insights relative to errors and misinterpretations. We can only hope that those who read our work will pick out the better ideas and discard the rest, preferably quietly. Yet this kind of work, risky as it is, is of fundamental importance, and monetary economics cannot really advance far without it. We need this kind of high-risk intellectual entrepreneurship—a willingness to stick one’s neck out with new ideas that may turn out to be brilliantly successful or may leave one falling flat on one’s face—and we also need critics who can look at the work of others and help sift out the good ideas from those that are indifferent or just plain wrong. This book offers both qualities in good measure—the entrepreneurship and the critical assessment of other work—and I hope it gets the attention it richly deserves. I also hope that the critical assessment of others will bear out my belief that the author achieves a pretty good ratio of hits to misses.

Kevin Dowd

PREFACE

The debate over free banking is one of the most important in economics today. It is perhaps the penultimate debate between those who advocate free markets and those who embrace (at least partial) central planning. Macroeconomic monetary policy conducted by a central bank is the last bastion of both methodological holism and the “constructivist rationalism” such holism often spawns. To advocate free banking is to mount an assault upon that citadel.

The seminal work in the modern theory of free banking is, of course, that of the late Friedrich A. Hayek. The second stage of development comprises the elaborations and modifications of that Hayekian foundation, which have been offered by Lawrence White, George Selgin, and Kevin Dowd, among others.

This book is an attempt to further the evolution of free-banking theory by (1) presenting a formal model of the White-Selgin analysis, (2) exploring the connection between free banking and Say’s Law, and (3) explaining why rational monetary policy is impossible in a central banking regime. In addition, the history of free banking in Scotland and the United States is discussed in some detail. Finally, there are reviews of alternative approaches to, as well as common criticisms of, free banking. I would hope that both the professional economist and the interested layperson would find something of value herein.

The present work is a significantly revised version of my doctoral dissertation at the University of Texas at Arlington. I would like, therefore, to express my thanks to the members of my dissertation committee: Thomas Holland, Eirik Furubotn, Dan Himarios, Larry Ziegler, Peggy Swanson, and Allan Saxe.

To Kevin Dowd I owe a special debt of gratitude. He was kind enough to write the foreword to this book. Moreover, I have benefited enormously from his many insightful comments and suggestions. He has been a friend. I am also

very grateful to Lawrence H. White for first exciting my interest in this topic with his *Free Banking in Britain*.

For offering me their comments and/or copies of their papers, I want to thank the following (in addition to Dowd and White): Milton Friedman, Robert Higgs, George Selgin, Leland B. Yeager, Donald R. Wells, Catherine England, Steven Horwitz, Thomas M. Humphrey, and Sheila Dow.

For their financial assistance, I extend my heartfelt thanks to both the Ludwig von Mises Institute and the Institute for Humane Studies. The fellowships they granted me were instrumental in the timely completion of my Ph.D. studies.

It should, of course, be understood that the views expressed herein are not necessarily the views of any of the individuals or institutes mentioned above.

Last, but certainly not least, I want to thank my wife Donna for her unflagging and essential support.

Chapter 1

INTRODUCTION

It is no longer possible to deny that there exist widespread academic concern for and dissatisfaction with the American financial system. In particular, various regulatory agencies have been singled out for criticism. The FDIC, the now-defunct FSLIC, and the Federal Reserve have all come under fire in the recent past.

It has been demonstrated that the FDIC and FSLIC have contributed to the banking and savings and loan (S&L) crises by virtue of their role as sources of “moral hazard.”¹ Moral hazard is the idea that any entity that is insured against risk—especially when it does not bear the full costs of the risk—tends to indulge in riskier behavior. The principal problem with FDIC insurance is that the premiums paid by financial institutions are not adjusted for the riskiness of the asset portfolios held by those institutions. As a predictable result, many institutions have acquired assets, for example, made loans that promised high potential rates of return but also were subject to significant risk. At the first sign of an economic downturn, many such assets experience rapid declines in their market value. This may leave the institution insolvent. Thus, deposit insurance has contributed to the large number of failures of both S&Ls and banks during the past decade.

Less thoroughly explored and less commonly discussed has been the instability brought about by the very existence of the American central bank, the Federal Reserve. Nevertheless, a growing number of economists have begun to perceive the Federal Reserve (the “Fed”) as an agency more concerned with its own authority than with the “general welfare” and as an ineffectual, even counterproductive, monetary authority. The following observations by three Nobel laureates perhaps convey the depth and breadth of such concerns.

Milton Friedman has stated that “in my opinion, no major institution in the

United States has so poor a record of performance over so long a period . . . as the Federal Reserve" (1985, 5). He goes on to recommend that we "abolish the money-creating powers of the Federal Reserve, freeze the quantity of high powered money, and deregulate the financial system" (1985, 12).² Friedrich Hayek has argued that "I do not think it an exaggeration to say that it is wholly impossible for a central bank subject to political control, or even exposed to serious political pressure, to regulate the quantity of money in a way conducive to a smoothly functioning market order" (1978, 113). James Buchanan, finding the existing operating structure wholly inadequate, proposes that the salaries of Fed officials be inversely related to the rate of inflation as a means of promoting monetary stability. He goes on to suggest that "if no incentive-motivational structure is deemed to be institutionally and politically feasible . . . the argument for more basic regime shift in the direction of an automatic or self-correcting system based on some commodity base is substantially strengthened" (1986, 148).

The question remains: Is the problem one of specific policies undertaken by the Fed (which, presumably, could be curbed by changing the motivational constraints on the Fed), or is the problem the fact that the United States has a central bank? In short, are central banks inherently inconsistent with monetary stability? The overwhelming majority of economists are very reluctant to answer the latter question in the affirmative. Despite the rapidly growing body of scholarly work on free banking, most still scoff at the idea that money can be safely and sanely provided in an unfettered market context. This is evidenced, for example, by the fact that free banking is rarely discussed sympathetically in textbooks, if it is mentioned at all.³

The position taken by advocates of free banking is that no amount of tinkering with the present system will suffice. They insist that only a fundamental change in the banking structure can solve the monetary problems faced by the United States or any nation. The purpose of this work is to explore the characteristics of the most radical of alternative regimes: free banking.

DEFINITIONS OF CENTRAL BANKING AND FREE BANKING

Before discussing free banking in any detail, one must first of all define the term—as well as its opposite, central banking. Central banking is a nonmarket, centralized approach to monetary matters. A central bank is granted certain legal powers and privileges that are the means by which it attempts to manipulate selected macroeconomic measures. These measures most often are the rate of inflation, the rate of unemployment, various market interest rates, and Gross National Product (GNP). The specific tools by use of which a central bank may affect the foregoing usually include (as in the case of the Federal Reserve) the buying and selling of government securities, changes in the rate of interest charged by the central bank on loans to private depository institutions,⁴ and changes in the reserve requirements imposed on these institutions.

It is crucial to understand that the central bank's roles as a holder of commercial bank reserves and as a supplier of credit both are derivative. Both depend largely on the fact that central banks typically are granted a legal monopoly on the issue of banknotes (Smith 1990, 168). That is, central banking and legal tender laws go hand-in-hand. Moreover, "a central bank is not a natural product of banking development. It is imposed from outside or comes into being as the result of Government favours" (Smith 1990, 169).

In contrast, one finds free banking, a term that denotes a market-oriented, decentralized approach to money. Free banking's most obvious features are (1) the absence of any central monetary authority and (2) the issuance of *notes* as well as deposit accounts by individual private banks. More generally, under a free-banking structure, "banks are free to pursue whatever policies they find advantageous in the issuing of liabilities and the holding of asset portfolios, subject only to the general legal prohibition against fraud or breach of contract" (White 1985, 117). Furthermore, "entry into a free banking system is unrestricted" (Selgin 1988b, 621), and "loans and securities would not be subjected to interest controls, nor would investment in any particular industry be mandated or forbidden . . . banks could even acquire equity positions in other firms" (Wells and Scruggs 1986b, 262). Also, such banks "would be free to open and close branches wherever they wanted" (Wells and Scruggs 1986b, 263). Finally, government deposit insurance would be neither necessary nor desirable, since market forces would encourage consumers to "find ways to protect their funds" privately (England 1988, 772). Thus, a "pure" free-banking system (which has never existed⁵) would be one in which there were (1) no governmental restrictions on entry or exit by firms into or out of banking, (2) no restrictions (other than the enforcement of valid contracts) on the issuing of notes as well as deposit accounts by financial institutions, (3) no central bank that acts as an *ex ante* lender of last resort, (4) no governmental deposit insurance, (5) no statutory reserve requirements, (6) no minimum capital requirements, (7) no restrictions on branching, (8) no restrictions regarding the kinds of activities in which a bank might engage, such as the underwriting of corporate stock or bond issues, and (9) no interest rate controls. In short, free banking means the total deregulation of the banking industry. It is the thorough application of the principles of *laissez faire* to the one realm of economic activity where even most "free market" economists have assumed such principles cannot be applied: money and banking.

One ambiguity must be addressed before progressing. What has just been described might be called "true" or "pure" free banking, or simply "*laissez-faire* banking." Historically, however, what has been called "free banking"—particularly in the United States—has often *not* been *laissez-faire* banking (Smith 1990, 169fn). That is, as will be discussed in Chapters 5 and 6, these historical episodes exhibited significant departures from the free-banking model. On the other hand, they all did share the one essential feature of free banking: multiple private issuers of banknotes. In short, the convention has arisen of classifying

historical periods as being (rough) examples of free banking as long as the issuance of banknotes had not been monopolized during the period in question. This is not necessarily an error. However, it does raise a potentially troublesome question. When an episode of historical free banking possesses some of the theoretical characteristics but lacks others, does one ascribe its success to the presence of some or to the absence of the others? Based on these mixed examples from history, are clear-cut tests of the free-banking model possible?

SPONTANEOUS EVOLUTION OF FREE BANKING

Having established in theory what free banking is, one is driven to inquire next how such a system might come into being. Perhaps the first work to address this issue was that by George A. Selgin and Lawrence H. White (1987). What follows is a summary of their lucid analysis.

First of all, Selgin and White point out that although there had been a few articles in recent years dealing with various aspects of unregulated monetary systems, none (at the time of their writing) had provided a logical evolutionary explanation of how such a system might develop. They do not suggest that their approach is the only valid method of explaining the rise of free market monetary institutions; indeed they explicitly acknowledge the value of optimization models that incorporate transaction costs and/or informational asymmetries. They merely note that theirs is a method that had not been utilized previously (Selgin and White 1987, 439).

The authors argue that, following the emergence of a standardized commodity money, the evolution of a free-banking regime proceeds through three stages: (1) “the development of basic money-transfer services which substitute for the physical transportation of specie,” (2) the “emergence of easily assignable and negotiable bank demand liabilities” (often referred to as “inside money”), and (3) the appearance of “arrangements for the routine exchange (“clearing”) of inside monies among rival banks” (Selgin and White 1987, 440). Each stage is allegedly a Smithian “invisible hand” outgrowth of the previous stage, that is, each new institutional arrangement is the unconscious product of the actors’ conscious concern with promoting their own self-interest.

Their explanation of the origin of money follows closely along that outlined by Carl Menger (1892). This simply recognizes that money arises in barter societies because of the inefficiency referred to by W. S. Jevons as the “double coincidence of wants.” Durable, highly divisible goods that were consistently in high demand for their use-value as commodities (gold, silver) came to be seen as a means of facilitating exchange by reducing search costs. These became money because of their high marketability. Private mints began to produce coins of standard weights of these metals as a means of reducing the costs of continual reassessment.

Logically, one next needs to reduce the inconvenience of frequent physical transfers of coins. This was accomplished—for the first time in history—by the

money-changers and bill brokers of twelfth-century Genoa who kept ledger accounts for frequent traders (Selgin and White 1987, 442). Notations in account books took the place of specie transfers. Thus deposit banking was born. In this context, Selgin and White point out why fractional reserve banking can develop in a rational and nonfraudulent manner: “(1) money is fungible, which allows a depositor to be repaid in coin and bullion not identical to that he brought in and (2) the law of large numbers with random withdrawals and deposits makes a fractional reserve sufficient to meet actual withdrawal demands with high probability” (1987, 443). This result is reinforced if one allows for the use of “option clauses,” as Selgin and White do.⁶

The desire for more sophisticated means of fund transfer led to the assignability and negotiability of deposited money, that is, to the appearance of fully negotiable banknotes and checkable deposits. To economize on the use of commodity money and to reduce the marginal liquidity costs of maintaining large specie reserves, banks naturally sought some form of regular note-exchange system, which would, by increasing the frequency with which rival banks’ notes were accepted at par, increase the marketability of their own notes. The same result might be accomplished in a very different way. Banks might engage in “note-duelling.” That is, they might begin buying a rival’s notes with the express purpose of presenting them suddenly to the issuer for redemption in specie, thereby hoping to damage the rival’s reputation or even precipitate his insolvency. Still, the likely result is widespread mutual acceptance of banknotes at par (Selgin and White 1987, 446–47). This is a classic example of the fact that the unintended consequences of agents’ acts may prove more significant and/or more durable than the intended consequences (Menger 1963, 130).

From a periodic note-exchange, it is but a small conceptual step to a formal clearinghouse function. The clearinghouse, by supervising the multilateral note and deposit exchange for a group of banks, greatly reduces the time and effort involved in the many pairwise clearing relations that would otherwise be required. Furthermore, the clearinghouse can serve as a credit information bureau, can police individual banks so as to ascertain their soundness, and can provide short-term liquidity to its members in times of financial crisis (Selgin and White 1987, 450).

Selgin and White conclude that all the essential functions of modern banking can be explained by a “spontaneous order” process and that nothing in the institutions that thus freely develop suggests anything about the need for a central bank (1987, 454). The far more common, contrary view will be examined in Chapter 8.

TWO FREE-BANKING MODELS

Monetary economics continues to be dominated by the almost unquestioned assumption that in order to achieve and maintain stability and real growth, all modern industrial nations must have a central bank that both conducts some

macromonetary policy and is the sole issuer of legal currency. Nevertheless, in recent years, challenges to that orthodoxy have been mounted by a growing number of theorists.⁷ Perhaps the most influential of these works have been the books by Friedrich Hayek (1978), White (1984a), Selgin (1988a), and Kevin Dowd (1989). There are two distinctly different models of free banking to be found therein. Each will be summarized below. Other approaches to free banking have been proposed by writers such as David Glasner (1989), Robert Greenfield and Leland Yeager (1983), W. William Woolsey and Leland Yeager (1991), Murray Rothbard (1983, 1985), and Ludwig von Mises (1966, 441–48). Such alternative approaches are the subject matter of Chapter 7.

Competing Paper Currencies

Hayek (1978) has proposed a system of competitively issued, inconvertible paper currencies. The incentive for the issuing bank is to be able to gain interest-free funds by inducing consumers to hold its currency. The incentive for the consumer is to gain a currency that possesses stable purchasing power. Such stability of purchasing power is, allegedly, to be guaranteed by the issuer and is to be defined in terms of some market basket of widely traded and homogeneous commodities, such as aluminum, cocoa, coffee, copper, and so forth (Hayek 1978, 56–57). Variations in the purchasing power of an issuer's currency would be constantly monitored by that issuer via computerized data from currency exchange markets. Appreciations would precipitate increases in supply; depreciations would bring decreases in supply. The definition of the market basket might change over time, however, if either consumer preferences or demand/supply elasticities of the commodities in question were to change (Hayek 1978, 44).

In this system, there would probably be only a handful of large banks that issued their own currencies; the majority of institutions would denominate deposits and loans in terms of one of those currencies. The small number of banks-of-issue would be due to the fact that only a few different currencies would, presumably, be marketable. This follows from Hayek's apparent belief that the information and transaction costs to consumers of coping with multiple currencies rise significantly as the number of such currencies increases (Hayek 1978, 23–24). Since the banks-of-issue would not want "to repeat the mistakes governments have made" (Hayek 1978, 61), they would not guarantee to bail out nonissuing banks that had outstanding obligations denominated in the currencies of the issuing banks. Thus, the large number of nonissuing banks would be compelled to practice more or less 100 percent reserve banking (Hayek 1978, 61). Such institutions would, therefore, be more like present-day finance companies than commercial banks.⁸

Competing Convertible Banknotes

It must be pointed out that although White (1984a) was the first since Vera C. Smith in 1936 to outline and defend the system described below, it has been

Selgin (1988a) who has greatly elaborated upon White's work. The fundamental aspects of the model—save one—are the same in both versions; the primary contrast is in terms of the much greater detail offered by Selgin. In particular, Selgin provides an insightful analysis of the relationships between free-banking activities and macroeconomic variables, such as national income and the price level. The one aspect that differs is that White assumes a small, open economy, because he is examining the Scottish free-banking period and, thus, assumes that the purchasing power of money is set exogenously by the world price of gold (1984a, 11), whereas Selgin apparently assumes (it is not stated explicitly) that he is dealing with a large, closed economy since he allows for endogenous changes in money's purchasing power (1988a, 99–102).

In the work of both White and Selgin, banks would, of course, be free to issue their own distinctive notes as well as deposit accounts. The supposed attraction for consumers would be the explicit guarantee by the issuing bank to redeem its notes in gold or silver upon demand of the holder.⁹ Banks would compete for consumers' patronage by providing branch offices in convenient locations, by remaining open longer hours per day and/or being open more days per year, and by offering higher rates of interest on deposits and lower rates on loans (White 1984a, 7–9). Above all, however, banks would vie with one another in terms of public confidence in the note issue. A bank's market share would increase as did consumers' belief that the bank would never fail to convert its notes (or deposit accounts) into specie on demand.

Unlike Hayek's model, here the supply of a given bank's notes would *not* vary according to either the exchange rates between currencies or the value of a particular market basket of commodities. Rather, a bank would regulate its note issue in response to the extent to which it experienced either "reflux" or "adverse clearings," that is, the return of its notes for redemption, either by individuals or by other banks (White 1984a, 14–18). Assuming each bank had a preferred specie/notes ratio (which White and Selgin take to be less than one; that is, these banks hold fractional reserves), the level of reflux and/or adverse clearings would determine the size of the bank's note circulation. The preferred, or "optimal," reserve ratio could change of course, as will be discussed in the next chapter. Indeed, the realization that a free bank's optimal reserve ratio is positively related to the income velocity of money will be seen to be one of Selgin's key contributions to the literature, as well as a critically important aspect of the formal model that will be presented.

Comparison of the Models

Under neither model of free banking is money production a natural monopoly, nor is money a public good.¹⁰ Issuers do not face marginal costs that decline throughout the relevant range of output. This follows from the fact that it is not the mere physical production of the banknote that is important; it is maintaining it in circulation that requires public acceptance and incurs rising marginal cost (White 1984a, 5–8). Furthermore, money cannot be a public

good, because its benefits are clearly excludable. Person B cannot enjoy the liquidity services provided by a unit of money that is held by Person A (Selgin 1988a, 154). Additionally, in Hayek's scheme, as well as in the White-Selgin model, the nominal money supply for the society is determined at a *microeconomic* level. Changes in said money supply certainly have important macroeconomic effects. Nevertheless, and in contrast to central banking, the source of the changes is microeconomic in nature. Both models imply that there is no role for a central bank that conducts monetary policy on a national basis. Many economists infer that chaos would inevitably result from the absence of centralized control. Yet, as Thomas Saving has pointed out, "competition is perfectly compatible with a stable monetary system" (1976, 994). The manner in which such stability might be achieved will be seen later.

The two models differ significantly, however, in regard to one aspect. In Hayek's system the various currencies ("ducats," "florins," "mengers," etc.) constitute separate units of account, whereas in the White-Selgin system, the competing banknotes, although distinct from one another and not necessarily possessed of equal marketability, nevertheless are assumed to be denominated in a single unit of account. Thus one might argue that Hayek's banknotes are more highly differentiated than are the White-Selgin notes. This is especially true if, as Hayek suggests, such units were to be trademarks of the issuing bank (1978, 42). All of this means that, in terms of the conventional market structures, Hayek's proposal may imply less "perfectly competitive" firms than does that of White and Selgin.

LIKELIHOOD OF THE WHITE-SELGIN MODEL

Assuming the complete deregulation of the financial services sector, which of the two approaches to free banking would be more likely to arise and, moreover, survive and prosper? At one level, of course, that question is unanswerable, since the results would depend on consumer preferences, which cannot be known to an observer *a priori*. However, there remain several aspects of the question that deserve comment nonetheless.

The principal attraction of the Hayekian currencies is, as was seen earlier, the promise of constant purchasing power. Thus, the critical issues become: (1) could such banks actually maintain such constancy in the purchasing power of money,¹¹ and (2) would it be maintained regardless of circumstances? Hayek himself seems to think that the only safeguard against fluctuations in purchasing power is the continual monitoring of the currency's value by consumers (1978, 59). But would such monitoring actually be an effective safeguard? There are reasons to doubt it.

First of all, what would be the effect on exchange rates between currencies if all banks-of-issue increased (or decreased) their supplies of notes at the same time and at the same rate? Exchange rates between the currencies would remain as before, and no signal would be sent to consumers to alter their money hold-

ings. As Hayek might point out, however, in his system, such exchange rates are not the ultimate measure of a currency's value. The ultimate yardstick for consumers is the price of the chosen basket of commodities in terms of the currency in question. Yet it is well known that commodity markets generally adjust to changing conditions more slowly than do financial markets. Would the prices of the relevant commodities change rapidly enough to warn consumers of inappropriate bank policies? It is not at all clear that one can answer that in the affirmative. Furthermore, if the basket of commodities chosen by a bank does not happen at all times to reflect the preferences of a particular consumer, it cannot be claimed that that consumer's purchasing power is being maintained even if such may be true for other consumers. Finally, one must keep in mind the possibility that not all consumers want constant purchasing power. Do not net debtors prefer inflation and net creditors desire deflation? Hayek does not deny this, but seems to think that those contrary preferences will offset one another in the market as a whole.

Even if Hayekian free banks could keep constant the purchasing power of their currencies—which, from the foregoing, seems problematic—the issue remains of whether (aside from the debtor/creditor issue) such constancy is always desirable. An obvious exception comes to mind. If either the supplies of inputs increase or there occur technological improvements such that marginal production costs pervasively decline, is not the proper economic result a general fall in prices? Indeed, to maintain a constant price level (and constant purchasing power of money) under such circumstances means that goods' prices are not in line with production costs and, as a result, “false profit signals” are generated (Selgin 1988a, 101). As will be seen in Chapter 2, free banks of the White-Selgin sort act so as to allow a general price decline in the face of falling production costs.

There are several additional reasons why one might expect banks that issue specie-convertible notes and deposit accounts to triumph over Hayekian banks in the free market. For example, it would seem plausible that the information costs to the consumer of constantly monitoring the fluctuating exchange rates among Hayek's various paper currencies might be significantly greater than those involved with holding notes issued by a bank that explicitly guarantees to redeem its notes in gold on demand. Furthermore, what of transaction costs? Recall that Hayek's proposed currencies are denominated in different units of account as well as being issued by different banks. This would seem to be significantly less efficient than the White-Selgin model where competitively issued banknotes are denominated in the same units. Also, considering the long Western tradition of specie-backed money, it seems clear that if the United States is fundamentally to reform its monetary system, the direction of that change is more likely to be toward a specie standard than toward inconvertible paper currencies. One may note that the 1981 U.S. Gold Commission appointed by President Ronald Reagan seriously considered a return to gold. Admittedly, this group never really addressed the topic of free banking. Neverthe-

less, that group's deliberations can be taken as a barometer of the continuing attractiveness of a specie standard in the minds of many.

Furthermore, it appears to a number of Hayek's critics, for example, Rothbard (1985, 3–4), that his plan contravenes the evolutionary development of media of exchange so eloquently stated by Carl Menger (1892) and restated by, among others, Ludwig von Mises (1971, 30–33), Selgin (1988a, 16–21), and Karl Warteryd (1989), the latter being in a game-theoretic context. That is to say, how does one progress, in the absence of legal tender laws that impose such a result, from commodity-redeemable currencies to complete fiduciary substitution—the exclusive use of pure paper (irredeemable) currencies? What “invisible hand” could bring this about? It is perhaps significant that Hayek never really comes to grips with this issue. Indeed, in his discussion of monetary developments, Hayek even grants that “it is probably impossible for pieces of paper or other tokens of a material itself of no significant market value to come to be gradually accepted and held as money unless they represent a claim on some valuable object” (1978, 27).

Hayek attempts to escape from this conundrum by suggesting that at present consumers will accept private paper currencies (at least those of stable purchasing power) because they have become accustomed to the paper currencies of governments and thus do not find the concept of inconvertibility objectionable (1978, 28). This, however, will just not do. What Hayek must explain is why, when, and if the government's monopoly on the production of legal currency is abolished, people would continue to prefer inconvertible paper money. In the absence of all legal restrictions on what one may use as “money,” is it not at least as likely that consumers would gravitate toward precisely that form of money that they have so often been denied by the passage of legal tender statutes, namely, commodity-backed currency?

Finally, one must point out that no private system such as Hayek describes has ever existed. On the other hand, rough approximations to the White-Selgin model can be found in the histories of a number of countries—the United States, Scotland, Sweden, Canada, and France, for instance (Selgin 1988a, 7–14). Clearly, this alone does not prove the desirability of one model over the other, but it does seem to lend further credence to the proposition that Hayek has inadequately defended his vision of free banking.

For all the foregoing reasons, this writer believes the approach of White and Selgin to be by far the more plausible. Therefore, their model of free banking will be the primary focus of this work. Furthermore, the work of Selgin and White, taken together, provides a much more detailed look at free banking than that of Hayek. The nature of those details, as well as a formal model of free banking on a specie standard, will be examined shortly.

OUTLINE OF THE BOOK

Chapter 2 derives a mathematical model of a free-banking system based on specie-convertible currency. The explicit equations employed emerge from a

detailed discussion of (1) the key characteristics of free banks, (2) the applicability of supply and demand analysis to money, (3) the meanings of "price" and "quantity" in the context of money, and (4) the nature of those factors, changes in which bring about shifts in either the money supply or money demand schedules. Graphical illustrations of those parametric effects are also presented. Chapters 3 and 4 explore related theoretical issues, namely, (1) the role of free banking in understanding and applying Say's Law and (2) the proposition that central banks are inherently unable to conduct a rational monetary policy. Chapter 5 both summarizes and critiques White's interpretation of free banking in Scotland. Chapter 6 is devoted to American free banking. A review of recent research is provided, as well as some new evidence on the relative macroeconomic stability of the U.S. free-banking era. Alternative approaches to free banking are discussed in Chapter 7. Some common criticisms of laissez-faire banking are examined in Chapter 8. Chapter 9 concludes the work with suggestions regarding (1) future research, (2) the transition process, and (3) the social, political, and economic necessity of free banking.

NOTES

1. For an excellent analysis of this issue, one should see Edward J. Kane, *The Gathering Crisis in Federal Deposit Insurance* (Cambridge: MIT Press, 1985).
2. Friedman, along with his long-time collaborator Anna J. Schwartz, repeats this theme in later work (Friedman and Schwartz 1986).
3. An exception is Miller and Pulsinelli (1989). Widely used texts, such as Lawrence Ritter and William Silber (1989) and Frederic Mishkin (1989), either ignore free banking altogether or dismiss it brusquely as chaotic and inflationary.
4. This may be a "discount" rate, as in the United States, or a "penalty" rate, as in Great Britain.
5. For detailed discussions of a number of *approximate* free-banking episodes, see Kevin Dowd, ed., *The Experience of Free Banking* (London: Routledge, 1992).
6. The option clause is a device by which a bank may delay the redemption of its notes in exchange for the payment of explicit interest to the noteholder. Option clauses will be discussed in Chapters 5 and 7.
7. Most of the extant articles and books on free banking are listed in the bibliographic section of this book.
8. It is somewhat ironic that Rothbard (1985) bitterly criticizes Hayek's proposal, since their approaches share one striking feature. In both cases, either most banks (Hayek) or all banks (Rothbard) must make loans out of their own capital rather than out of funds deposited. This follows from the fact that they practice 100 percent reserve banking.
9. Such redemption may or may not be immediate. Both White and Selgin see no problem in permitting banks to issue notes subject to option clauses.
10. One should refer to Chapter 8 for an extended discussion of these points.
11. This one may be taken to be the inverse of the price level. However, there are two possible interpretations of the concept "price level." The conventional understanding of the term is that the price level is the weighted average of a large number of selected relative prices, as embodied, for example, in the CPI (Timberlake 1987, 88–

91). An alternative view is that the price level should be thought of in a more micro-economic way. This approach argues that the price level is nothing more or less than the array of all relative prices, which, supposedly, no index number can represent meaningfully (Rothbard 1988a, 182–83).

Chapter 2

COMPARATIVE STATICS

The purpose of this chapter is to offer a formal interpretation of the most detailed verbal treatment of free banking extant: George Selgin's explanation of such a system structured around a specie-convertible currency (1988a, 1988b, 1990). The key points in Selgin's argument, as well as the relevant features of the present work, will be identified. A mathematical model will be constructed from which comparative static equilibrium conclusions will be drawn. Also, graphical illustrations of the various parametric effects will be offered. It is hoped that this effort will both capture the essential elements of Selgin's model and facilitate the classroom presentation of same.

THE MEANING OF MONEY

First of all, one must make clear what Selgin (and the present study) means by the term "money." His focus is on the classic medium of exchange function. Thus, he takes money to be the sum of currency held by the public plus checkable deposits, that is, the total of "inside money"—the aggregate demand liabilities of commercial banks. Selgin deals rather little with "outside money" (circulating specie coins), since he believes that "in a mature free banking system . . . commodity money seldom if ever appears in circulation" (1988a, 31). Moreover, he notes that his primary concern will be with the issuing of private currency (banknotes), since that is "a relatively unfamiliar and unexplored possibility, and one that most economists dismiss" (1988a, 5). Besides, the topic of bank competition for checkable deposits has "been extensively dealt with elsewhere" (1988a, 4).

KEY CHARACTERISTICS OF FREE BANKING

There are at least three dimensions along which free banks differ significantly from commercial banks in a central banking system. First of all, reserve ratios are not set by law; free banks may hold whatever specie reserves they deem prudent. Thus, perhaps the most common mechanism by which the nominal supply of money varies is not an exogenous change in the monetary base, but an endogenous change in the so-called money multiplier. Indeed, Selgin explicitly allows for the possibility of a constant monetary base (1988a, 167–69).¹ Second, since there would be no legal tender laws, free banks must expend real resources in order to expand the circulation of their currencies. This implies that free banks face rising marginal costs. Finally, free banking exhibits a unique relationship with credit markets. Because nontrivial amounts of real resources are needed for a free bank to increase its liabilities, if that is to occur, it is necessary for the public to refrain voluntarily from some degree of present consumption; that is, savings must rise. In contrast to central banking, it is unlikely that free banking could create an excess of credit.

Optimal Reserve Ratios

Perhaps the single most important theoretical contribution that Selgin makes is his exhumation and elucidation of a principle largely buried and forgotten by a world of economists accustomed to central banks and legally imposed reserve requirements: the realization that, under competitive conditions, changes in the income velocity of money bring about changes in banks' demand for reserves in the same direction (1988a, 70–80). Citing discussions of this principle that date as far back as F. Y. Edgeworth in 1888, Selgin argues that a bank's demand for reserves depends not only on the total volume of transactions, but also on the frequency of those transactions (1988a, 74). One must understand that in Selgin's proposed system, reserves are in the form of gold coin, and they are needed in order to (1) redeem notes and/or demand deposits held by customers and (2) settle interbank clearing debts.

Item (1) above is the concept of "reflux" utilized by Lawrence White (1984a, 14–18). Item (2) is the closely related concept of "adverse clearings." Both function as automatic corrective devices, and both arise from attempts by a single bank to overissue its currency or deposit accounts. However, adverse clearings exhibit an additional feature. They are, under most conditions, positively related to both the volume and frequency of monetary transactions in the geographical area under consideration, but what if all banks in an area experienced "equal and simultaneous changes" in the demand for their respective liabilities (Selgin 1988a, 73)? Selgin concedes that in that special case (an unlikely one), all banks would be affected equiproportionally and the component of their total demand for reserves, which reflects their relative positions

(“average net reserve demand”), would not change. Nevertheless, a second component of total demand for reserves would still be affected. This is the “precautionary reserve demand,” and it stems not from the average expected level of adverse clearings, but from the probability of random fluctuations around that expected level (Selgin 1988a, 72–74). It is interesting to observe that Don Patinkin presents the same argument, although he couches the principle in terms of a consumer’s demand for cash balances to meet personal liabilities (1965, 82–88). The principle applies equally well in both cases.

Thus, for example, a decline in velocity (an increase in its reciprocal, the Cambridge cash balance equation’s “ k ”) reduces banks’ need for reserves. This brings about a decline in their preferred (or optimal) reserve ratios, the money multiplier rises, and the money supply increases so as to maintain monetary equilibrium. Free banks “passively adjust the supply of inside money to changes in the demand for it. They are credit transferers or intermediaries, and not credit creators” (Selgin 1988a, 82). In other words, in the typical Keynesian scenario of a depression in which a significant “hoarding” of cash balances occurs (k rises), free banks would tend to respond automatically by increasing the money supply so that nominal incomes might be maintained.

It would be reasonable at this point to wonder whether such a mechanism would exhibit sufficiently powerful effects to achieve the kind of countercyclical results Selgin envisions. In short, by how much will banks’ reserve holdings change because of a change in the frequency of transactions? Patinkin, among others, supplies an answer: An entity’s optimal liquid holdings will change by a factor equal to the square root of the factor by which transaction frequency changes (1965, 87).

One might experiment with a hypothetical example. Assume that at time t_0 , total bank reserves equal \$1 billion, the supply of inside money equals \$3 billion, and the simple money multiplier, therefore, equals 3. Suppose further that at time t_0 , the frequency of transactions is 20/period, but that at t_1 , this falls to 15/period. Thus, frequency changes by a factor of .75. Since the square root of that is .866, the optimal reserves of banks will fall to \$.866 billion, creating excess reserves of \$.134 billion. The new money multiplier is the reciprocal of the new optimal reserve ratio, or 3.464. Thus, the increase in the money supply should equal excess reserves multiplied by 3.464, or \$.464 billion. In proportional terms, a 25 percent decrease in frequency leads to a 15.5 percent increase in the nominal money supply, and this, it must be remembered, is merely the effect of the decline in the *frequency* of transactions on reserves and the money supply. It is likely that the *volume* of transactions would also decline and, thereby, amplify such results. Furthermore, Ernst Baltensperger has argued that the effect on reserve holdings of a change in frequency will be larger than the square root rule suggests. He states that “the elasticity of demand for precautionary reserves with respect to scale can be quite different from one-half (the value implied by the standard square root

result) and may well be in the neighborhood of one" (1974, 210).² It would seem that the magnitude of this effect is sufficient to act in the fashion Selgin suggests.

Marginal Costs

Of considerable importance to the perspective adopted in this book is the argument that, in contrast to central banking, the short-run marginal costs to free banks of producing, issuing, and—most significant of all—maintaining in circulation their notes are positive and rising. Central banks are usually described as facing marginal costs of production and circulation, given the presumptions of irredeemable paper currency and legal tender laws, that are constant and approximately zero (Meyer 1982, 41). In other words, the short-run costs of central banks are almost exclusively fixed costs. This is quite plausible. Such central banks, being legal monopolists, need not (1) redeem their liabilities on demand in terms of some commodity, (2) clear any interbank debts arising from a note-exchange system, or (3) compete for customers with other domestic currency suppliers.

The situation is very different for free banks of the sort modeled in this chapter. Free banks emphatically *do* have to redeem their liabilities in specie on demand, clear their interbank debts, and compete for customers. In order to redeem notes and clear debts with other banks, a free bank must hold some specie reserves. This fact, if taken alone, might seem to imply that such a bank's short-run marginal costs are definitely positive but constant, since, for any given income velocity of money, the same fractional reserves are held as backing for each additional unit of currency in circulation. However, it is likely that the unit cost of acquiring specie rises with the demand for it.³ Therefore, an increased demand for specie as backing for a bank's expanded circulation of currency would entail rising marginal (liquidity) costs.

Moreover, it is also true that free banks, if they are to increase the quantity of their notes in circulation, must compete with one another for customers. That is, they must attract additional business by offering new or better services and/or by having longer operating hours. That necessitates either the hiring of new employees or the more intensive utilization of their present employees. As David Glasner has remarked: "Aside from holding non-interest-bearing reserves, what other costs does a bank incur? Primarily wages. Banking is a labor-using activity" (1989, 17). If one accepts the validity of the law of diminishing marginal returns, it is then necessarily true that a free bank's incremental labor costs rise as its note circulation increases in the short run.

Last, but not least, to attract additional deposits, a free bank (like present-day banks) must offer a higher interest rate on said deposits. Thus, interest expenditures rise at the margin.

The import of all the foregoing seems clear. For a given optimal reserve ratio, a given reputation for redemption,⁴ given plant and equipment, and given

technology, the short-run marginal costs of a free bank increase as it issues more notes. Needless to say, similar costs also apply to a bank's expansion of its deposit liabilities. In short, a free bank's short-run marginal cost schedule must be positively sloped: $(d^2C/dM^2) > \emptyset$, where C is total cost and M is the nominal quantity of money.

This conclusion is one commonly drawn by free-banking theorists. White refers to "the rising marginal costs associated with a growing volume of bank-notes outstanding" and "the rising marginal costs of expanding the bank's deposit business" (1984a, 6). Selgin (1988a, 96), Kevin Dowd (1989, 45–46), and Glasner (1989, 18–20) all make similar references to the cost structure of a free bank that issues specie-convertible liabilities.

Given that the marginal cost schedule is positively sloped and that the marginal revenue schedule is either horizontal (perfect competition) or negatively sloped (oligopoly or monopolistic competition), then profit-maximizing free banks would not, contrary to conventional belief, flood the market with unlimited quantities of inside money. To argue otherwise is to assume that free banks would systematically fail to act in their own self-interest. Moreover, it assumes that consumers are willing to hold money balances whose per-unit purchasing power is rapidly declining.

Money and Loanable Funds

A third distinctive feature of free banking deals with the relationship between a competitively issued money supply and the market for loanable funds. Specifically, the question is whether or not the preservation of monetary equilibrium, by means of changes in the supply of loanable funds, is consistent with voluntary savings. Selgin argues that it is, since the "aggregate demand to hold balances of inside money is a reflection of the public's willingness to supply loanable funds through the banks whose liabilities are held. To hold inside money is to engage in voluntary saving" (1988a, 54). This is true because to hold the liabilities of free banks is to choose to refrain from purchasing goods and services. In effect, as long as the supply of inside money keeps pace with changes in the demand for inside money, free banks loan out only that which has been willingly saved. They are "simply intermediaries of loanable funds" (Selgin 1988a, 55).

This relationship further implies that a well-functioning free-banking system would maintain the market rate of interest on loanable funds at the level Knut Wicksell called "a certain rate of interest on loans which is neutral in respect to commodity prices, and tends neither to raise nor to lower them . . . the natural rate of interest on capital" (1936, 102). Since a number of economists have argued that departures of the market rate from the natural rate constitute the primary source of business cycles—or "intertemporal discoordination" as Friedrich Hayek puts it (1935, 85–100)—it would appear that free banking would minimize such cyclical fluctuations. Real shocks would still occur, but

cycles merely resulting from disequilibria in the money and credit markets would be more or less eliminated.

If one recalls the earlier discussion of the countercyclical effects of a change in the income velocity of money on free banks' optimal reserve ratios and, therefore, on the money supply, such a suggestion becomes plausible. The details of the relationship between banking and business cycles alone would constitute a complete work, so they will not be presented here. To pursue the issue, one might consult Gerald O'Driscoll (1977), Hayek (1933, 1935, 1941), Ludwig von Mises (1971, 349–66), Milton Friedman (1968), or David Laidler (1981). However, Chapter 3 is devoted to a limited discussion of some of the more important aspects of the question.

In mechanistic terms, one may describe the markets for (1) money and (2) loanable funds under a free-banking structure as follows: The demand for money and the supply of loanable funds are positively related. Thus, "an increase in the demand for money warrants an increase in bank loans and investments. A decrease in the demand for money warrants a reduction in bank loans and investments" (Selgin 1988a, 55). This makes interest rate signals redundant for free banks. That is, what is more immediate and more telling in effect is a change in the demand for money that reveals itself by way of a change in the level of adverse interbank clearings and, thereby, in the optimal reserve ratio. If, for example, the demand for money and its purchasing power per unit rise (the price level falls), then the quantity of money supplied and the supply of loanable funds will also rise, bringing about a lower market interest rate. If the demand for money and its purchasing power fall (the price level rises), the quantity of money supplied as well as the supply of loanable funds will fall, leading to a higher rate of interest. One may take note from the foregoing that free banking should be consistent with the long-observed positive relation between the price level and market interest rates, a phenomenon dubbed the "Gibson paradox" by John Maynard Keynes (1930, 198–208).

A FORMAL MODEL

Rather little has been done in the way of formalizing free-banking theory. This is understandable in light of the fact that economists of the Austrian School have been in the vanguard of such work. The Austrian critique of and aversion to mathematical modeling is well known.⁵

Nevertheless, White offers an insightful, but brief, Lagrangian analysis of free banks (1984a, 3–12), although Selgin's early work is entirely verbal except for bits of algebra regarding money multipliers and the precautionary demand for reserves (1988a, 75–76, 124–25). Bart Taub (1985) provides an analysis of banks that issue inconveritible paper currencies along the lines of Hayek's proposal. However, the works by Hayek (1978), Dowd (1988, 1989), Robert King (1983), Robert Greenfield and Leland Yeager (1983), Glasner (1989), Donald Wells and Leslie Scruggs (1983, 1984, 1986a, 1986b), and Selgin and

White (1987) are verbal in method. More recently, mathematical treatments have been offered by Carl Christ (1989), Larry Sechrest (1990, 24–65), and Selgin (1991).⁶

In the following pages, this writer presents a simple comparative statics model of free banking that utilizes elementary differential calculus, matrix algebra, and graphs. These have become—for good or ill—some of the standard tools of the economics profession. Moreover, the methods used should be familiar to all graduate students as well as to many advanced undergraduate students of economics. The intent is to supply a model that can readily be used in a classroom context to explain the essential features of free banking.

One is here reminded of the formalization of Keynes' ideas provided by John Hicks (1937). Without that boost, the so-called “Keynesian revolution” might have been stillborn. No claim is being made that the present work will prove as influential as that of Hicks. Nevertheless, this effort bears the same relation to that of Selgin (and, to a lesser extent, to that of White) that Hicks' essay bears to *The General Theory of Employment, Interest, and Money*.

Some will question the need for a formal model. In defense of such, one may argue that a mathematical approach forces one to “check his premises,” that is, to (1) identify those factors that are the variables and the parameters of the function at hand and (2) ascertain how such factors affect said function. In the process of doing so, anomalies, contradictions, and hidden assumptions may be revealed. As for graphs, one need only point out that they have proven themselves to be excellent expository and pedagogical devices over a considerable span of time.⁷

Others may find the model insufficiently exotic. No cognizance is taken of informational asymmetries, transaction costs, moral hazard, externalities, adverse selection, rational expectations, or game theory, to name a few of the possible approaches that could be taken. The reason is straightforward. None of the above is necessary in order to capture the basics of free banking.

As Dowd has said, “Money and the industry that provides it, the banking system, can be understood using the same kinds of analytical tools which we apply to other commodities and the industries that produce them . . . there is nothing fundamentally different about money at all” (1989, vii). Selgin seems to concur when he states that “nothing about free banking requires it to be approached with technical sophistication beyond what might be found in a graduate money and banking textbook” (1988a, 5). Regarding his initial interest in free banking, Glasner adds that “the notion that the analysis of the supply of money should be carried out within the same framework that we use to analyze the supply of other goods was a compelling one” (1989, xiv). In short, if supply and demand suffice to explain the market for televisions or corporate bonds or housing, then supply and demand will suffice to explain free banking.

Furthermore, the suggestion that standard price theory is applicable to money and banking is not unique to advocates of free banking. There exist a number of such applications in the literature. For example, Jurg Niehans (1978, 166–

99) develops a detailed theory of profit-maximizing bank behavior that focuses on rates of interest paid on deposits and charged on loans. Graphically and mathematically, Niehans' effort clearly represents a price-theory approach to banking. A different treatment using the same methodological tools is that of Lyle Gramley and Samuel Chase (1965), in which they describe the interactions in a world of four assets (currency and reserve deposit credits issued by a central bank, demand deposits, time deposits, and private securities) and three sectors (a central bank, commercial banks, and the public). Other examples one might mention are Raymond Lombra and Herbert Kaufman (1984), Bruce Dalgaard (1987, 337–39), John Gurley and Edward Shaw (1960), James Tobin (1963), and Boris Pesek and Thomas Saving (1967, 79–126; 1968, 144–63). Particularly striking are the statements by Pesek and Saving that “commercial banks are producers and sellers of money” (1967, 79), that “the standard analysis learned in principles of economics is just as applicable to a bank as to any other firm in the economy” (1968, 163), and that “the equilibrium quantity and price of any good, *including money*, depend on both demand and supply” (emphasis added) (1968, 50). Furthermore, one must not overlook the fact that both Selgin (1988a, 95–96) and White (1984a, 5–7) explicitly argue that the first-order condition for profit maximization, that is, production at a level where marginal cost equals marginal revenue, is as relevant to a free bank as it is to any other firm.

Finally, it may be observed that some renowned economists have in the past insisted that money is as subject to supply and demand conditions as is any other economic good. Arthur C. Pigou stated that the exchange value of money “is governed, like the value of everything else, by the general conditions of demand and supply” (1917, 39). Similarly, Jean-Baptiste Say asserted that money “is a commodity, whose value is determined by the same general laws, as that of all other commodities; that is to say, rises and falls in proportion to the relative demand and supply” (1971, 226).⁸ John Stuart Mill argued at length along such lines. Mill saw that

the value or purchasing power of money depends, in the first instance, on demand and supply. But demand and supply, in relation to money, present themselves in a somewhat different shape from the demand and supply of other things . . . whoever sells corn, or tallow, or cotton, buys money. Whoever buys bread, or wine, or clothes, sells money. (1923, 490)

That is precisely the perspective adopted here.

As indicated earlier, an attempt will be made to apply neoclassical price theory to free-banking firms, a free-banking industry, and the relations between the industry and the economy as a whole. In all graphical illustrations, the axes depicted will represent Walrasian price/quantity space, where price is assumed to be the independent and quantity the dependent variable.

The time period involved is assumed to be the Marshallian short run as op-

posed to the “market period” or the “long run” (Marshall 1949, 330, 378–79). The very short run, or market period, is rejected, since it is too short to permit an analysis of how free banks might react to changing conditions. The long run is similarly rejected, because it allows no differentiation of free banking from central banking. Given enough time for all adjustments to be made, there will be neither excess quantity of money supplied nor excess quantity of money demanded at the existing level of prices, regardless of the banking regime. The critical question to be examined is how free banks react to changes in economic conditions in the short run. Finally, the following simplifying assumptions will be made: (1) all banks face identical costs, (2) because of the absence of any legal barriers to entry (or exit), the market structure is one of perfect competition,⁹ and (3) the society being modeled is a large, closed economy. Therefore, the purchasing power of money is an endogenous variable.

The Variables

Given that there exist sufficient justification and precedent for a price-theoretical approach to free banking, one must next identify the variables, changes in which bring about movement along either the demand schedule or the supply schedule. That is, what do the independent variable “price” and the dependent variable “quantity” represent?

Here the term “quantity” refers to the number of units of inside money (currency plus demand deposits) held by the public during any given time period. The unit of measure is assumed to be the “dollar.”¹⁰ The objection might be raised at this point that to use the dollar as a unit is quite arbitrary and that, therefore, the price of money is indeterminate, being dependent on the definition of the quantity measure. By that sort of reasoning, however, the price of almost everything would become indeterminate, since most commodities are traded in terms of units just as arbitrary as the dollar. For example, why sell gasoline by the gallon instead of by the liter or potatoes by the pound instead of by the kilogram? All such units are arbitrary in a sense. Nevertheless, being reinforced by convenience or custom, they are meaningful to both buyer and seller. Here the dollar will be taken to be the meaningful unit of money.

What then of price? What, indeed, should one understand the price of money to be? Most scholarly articles and most textbooks—see Campbell McConnell (1987, 345–47) and Lawrence Ritter and William Silber (1989, 314–23), for example—assume without hesitation that the price of money is some interest rate, this assumption being based on the idea that forgone interest on some alternative financial asset is the opportunity cost of holding money and, thus, money’s price. If the interest rate¹¹ is the price of money, then there is a problem. It is unavoidable that the interest rate is the price of credit, or loanable funds, but how can the interest rate be the price of both money and credit? Surely to suggest such a thing is erroneously to posit that money and credit are identical. This is very common, but nonetheless false.

As Friedman has stated, "The confusion of money and credit has been a primary source of difficulty in monetary policy. And recent experience indicates this is still so" (1969, 263). Moreover, "the interest rate is not the price of money. The interest rate is the price of credit . . . the inverse of the price level is the price of money" (Friedman 1972, 201). Robert Greenfield and Leland Yeager arrive at a similar conclusion while discussing a different topic. They suggest that "to suppose the interest rate to be the 'price of money,' determined so as to ensure that each existing unit of money is a unit demanded in cash balances as well—is to blur two analytically distinguishable concepts, money and credit" (1986, 371). The pervasiveness of this error may be seen in the fact that Gurley and Shaw (1960), Tobin (1963), Lyle Gramley and Samuel Chase (1965), Niehans (1978), Lombra and Kaufman (1984), Dalgaard (1987), and even White (1984a), Benjamin Klein (1974), and Taub (1985) all speak of the interest rate as the price of money.

Is Friedman alone in his belief that the price of money is its purchasing power per unit, that is, the reciprocal of the price level? By no means. Don Patinkin explains with his usual lucidity that although the "absolute price level" is the price of real money balances, the "reciprocal of the price level $1/P$ can be considered as the 'real' or 'relative' price of the good nominal money holdings. Accordingly, we can conceive of a curve which describes the demand for these holdings as a function of this relative price" (1965, 28). Pesek and Saving refer to "the realization that the general price level is the reciprocal of the average relative price of money" (1967, 58). Richard Timberlake and Edward Selby offer a graphical illustration much like that of Patinkin in which the nominal demand for money is plotted as a function of the "inversion of a price index" (1972, 83).

As with the works just cited, this book will take the price of nominal money holdings to be their purchasing power per unit (PPM).¹² It is further assumed that such purchasing power can be measured (at least approximately) by the reciprocal of the price level ($1/P$), with that price level represented by the appropriate price index.¹³

Insofar as the application of price theory to free banking is concerned, one must be careful to reason in a fashion that is parallel to, but the inverse of the ordinary process. That is, individual consumer demand schedules do exist, and the horizontal summation of such constitutes the market demand schedule (since money is not a public good). However, such schedules represent, *ceteris paribus*, not the quantities of some good or service that consumers will purchase at various money prices, but rather the quantities of nominal inside money consumers choose to acquire by exchanging various amounts of goods or services for them. The demand schedules are negatively sloped since, *ceteris paribus*, as the purchasing power of each dollar falls, consumers must hold more dollars if they are to maintain the same total purchasing power, that is, command over the same real goods (Patinkin 1965, 28–31).

On the supply side, one finds that each firm experiences short-run costs that

rise at the margin and that the horizontal summation of such marginal cost curves produces a market supply schedule. The marginal cost schedule facing each firm represents the manner in which its total costs vary as the quantity supplied changes. In this instance, however, cost is measured not in monetary terms, but in terms of actual goods or services needed to produce and (more importantly) maintain in circulation various quantities of money. Thus, the positively sloped market supply schedule reveals the quantities of money banks will offer for goods and services at various rates of exchange.

It has been suggested that the methodological heart of neoclassical theory consists of (1) the identification of certain key concepts (exemplars) and (2) the consistent application of those concepts to disparate topics so as to form matrices (paradigms) that reveal both gaps in the theory and its essential parallelism (Holland 1987). The present analysis—idiosyncratic though it may appear—does not violate such parallelism. Specifically, what does a firm give up and receive when it produces and sells its product? For the typical firm, the answers are, respectively, marginal cost and marginal revenue, with both couched in monetary terms since goods trade against money. For a “money producer” (a free bank), however, the firm’s product trades against goods and services, not money. Thus, for such firms, marginal cost and marginal revenue must be measured in terms of goods and services rather than in money terms. If the price of money is its purchasing power, it cannot be otherwise.

At this point, some readers might voice a concern about a particular aspect of the sort of supply and demand analysis described above. They might question whether it is appropriate to use supply and demand schedules at the market level, or marginal cost and marginal revenue schedules at the level of the firm, to portray a *stock*, such as money balances, since such schedules are conventionally taken to represent *flows*. This is not an insurmountable problem.

Pesek and Saving state in a straightforward fashion that “the supply of money at a point in time will consist of (1) the stock existing in the previous period and (2) any net additions . . . that occur during the period in question. If the additions to the stock exceed the reductions in the stock, then the stock of money will be increasing, and if the additions are less than the reductions, it will be decreasing” (1968, 50). Furthermore, “because the current output of money is a small part of the existing stock of money, the increases in revenue from producing an additional unit of the money commodity will equal its price” (Pesek and Saving 1968, 51). Finally, “the equilibrium stock of money will occur where the demand for money function intersects the supply of money function” (Pesek and Saving 1968, 52). Obviously, those two economists find nothing incongruous about the application of supply and demand concepts to money. Still, they fail to provide any explicit justification for the combination of stocks and flows—of money or any other traded good—in the same diagram.

For such a justification, one may turn to Patinkin (1965, 516–21), who points out that if one has a flow (F), a discount rate (r) per time period, and a number (h) of such time periods per payment interval, then the related stock (S_0) can

be expressed as: $S_0 = F/rh$. It is important to realize that if the definition of the time period changes (from, say, a week to a day), the values of S_0 and F remain unchanged. All that would occur is that h would rise by a factor of seven and r would fall to one-seventh of its former value. Yet if h changes while the time unit remains constant, then F changes proportionally, leaving S_0 unchanged. It is in this sense that stocks are “time-dimensionless,” whereas flows are not.

Patinkin notes that, properly understood, a flow should *not* be thought of as some quantity per unit of time, but rather as “a quantity whose magnitude is directly proportionate to h ,” whereas a stock is *not* a quantity measured at some instant in time, but “a quantity whose magnitude is independent of h . Clearly, such ‘stocks’ and ‘flows’ can be added together” (1965, 521). If stocks and flows can be added together, they must be of the same dimensions. Thus, one is not remiss in viewing money in a supply and demand context.

The Parameters

In the previous section, the issues of money’s price (PPM) and quantity were discussed. Briefly, it was seen that an increase (decrease) in the level of goods’ prices, that is, a decrease (increase) in the purchasing power of money, led to an increase (decrease) in the quantity of money demanded and to a decrease (increase) in the quantity of money supplied. In short, typical positively sloped supply curves and negatively sloped demand curves are involved. Thus, changes in the price level elicit movements along existing nominal money supply (MS) or nominal money demand (MD) curves.

What, however, are the parameters of MS and MD? That is, what factors will bring about shifts of the MS or MD schedule? Mirroring Selgin’s treatment, five suggest themselves: (1) the ratio of money desired as a fraction of income (k), (2) changes in real income (y) that result from an increase in productivity, (3) changes in the specie reserves (S) that form the monetary base of free banking, (4) changes in the composition of currency demand, that is, changes in the public’s desired ratio of inside to outside money (k_i/k_o), and (5) the real unit cost of specie (P_s) (Selgin 1988a, 96, 98–102, 113, 129–33; 1990; 1991). These five will be utilized in a simultaneous equation system. Another issue, the effects of a change in the composition of the public’s demand for money, that is, a change in the desired ratio of currency to demand deposits (C/DD), will be examined separately.

The direction of the effect of k , y , S , and P_s on MS or MD is assumed to be as follows. An increase in k —which is initially taken to mean the ratio of desired nominal inside money holdings to nominal income, since specie “seldom if ever appears in circulation” (Selgin 1988a, 31) in a mature free-banking system—increases both the demand for money and the supply of it. The impact on demand follows from the Cambridge cash balance equation ($M = kPy$), whereas the effect on supply is derived from the fact that a free bank’s demand for

specie reserves is inversely related to k . This latter fact, which was explained in some detail in an earlier section of this chapter, implies that as k rises, the money supply will also rise, *ceteris paribus*.

When real output/income rises because of productivity gains, then y rises. Such an increase in y increases the demand for money (Cambridge cash balance equation again), but decreases the supply of money. This latter may appear paradoxical, but it is not. If either the supplies of inputs increase or technological improvements occur, then such gains will generally bring about lower money costs of producing nonmonetary goods and services. Thinking inversely again, this means that the costs in terms of real goods and services of producing money and maintaining it in circulation have risen. Therefore, the marginal cost curves of individual banks and the market supply curve shift up and to the left.

An increase in S should have no effect on the demand for money, but it will increase the supply of money. Such a conclusion follows from the simple fact that, under such a free-banking system, specie represents the monetary base. Furthermore, just as with a central banking structure, an increase in the monetary base should, *ceteris paribus*, increase the money supply.

An increase in P_s , the real cost of specie, increases the marginal liquidity costs of free banks. That is, if P_s rises, their costs in terms of real goods and services—for any given optimal reserve ratio—of each additional dollar of money in circulation must rise. So an increase in P_s brings about a leftward shift in each of the marginal cost curves for each bank and the market supply curve.

As a succinct summary of the foregoing, the following relationships are herein assumed:

$$\begin{aligned}\frac{\partial MD}{\partial P} > \emptyset, \quad \frac{\partial MD}{\partial k} > \emptyset, \quad \frac{\partial MD}{\partial y} > \emptyset, \quad \frac{\partial MD}{\partial S} = \emptyset, \quad \frac{\partial MD}{\partial P_s} = \emptyset \\ \frac{\partial MS}{\partial P} < \emptyset, \quad \frac{\partial MS}{\partial k} > \emptyset, \quad \frac{\partial MS}{\partial y} < \emptyset, \quad \frac{\partial MS}{\partial S} > \emptyset, \quad \frac{\partial MS}{\partial P_s} < \emptyset\end{aligned}$$

A Quantity Theory Approach

Regarding model selection, two considerations were of paramount importance: (1) to utilize the simplest model that produced useful conclusions and (2) to reflect, as closely as possible, Selgin's presentation.¹⁴ Therefore, a quantity theory approach was chosen. Here the demand for money is a function only of k , P , and y ; interest rates play no role.¹⁵ Both the prices of goods and the prices of inputs respond to market considerations, that is, they are "flexible" (though not necessarily instantaneously so) rather than "fixed." Aggregate demand and, therefore, nominal income are affected by nominal money holdings, but real income is determined exogenously.

Two items common to many macromodels are missing from this one: a "real-

balance effect" and a bond market. The real-balance effect refers to the idea that, for given aggregate nominal money holdings, as the price level falls, real money balances increase and, as a result, consumer expenditures rise as well. In the system Selgin describes, however, the real-balance effect on expenditures will be small or even nonexistent.

The controversy over whether there will be such an effect in an all-inside-money regime dates back to the late 1960s. At first it was thought that if there were no outside money in circulation, then there would be no real-balance effect (Patinkin 1965, 297). Later it was demonstrated that the inside-outside contrast was not the determining factor. What was crucial was whether the money represented net wealth, and, as David Laidler has pointed out, "regardless of whose liability it is, any money which bears interest at a market rate is not net wealth on the margin, and any money which does not bear such interest is net wealth" (1990, 33). In all modern industrial economies, the money supply consists primarily of deposits, not banknotes or coins. There is no reason to think matters would be appreciably different under free banking. Since competition would compel banks to pay interest on deposits,¹⁶ only a fraction of the money supply could constitute net wealth. Furthermore, it is even conceivable, though unlikely, that interest might be paid on banknotes.¹⁷ Therefore, free banking will exhibit a small, or no, real-balance effect.

The bond (or credit) market is ignored (for now), because it is superfluous. If certain comparative statics properties emerge from a system "when analyzed from the viewpoint of the commodity and bond markets, then it must also be stable—or have these properties—when analyzed from the viewpoint of the commodity and money markets. Every set of assumptions in the former framework has its exact counterpart in the latter" (Patinkin 1965, 377). Here the focus is on the commodity and money markets.

The specification of the model takes the following forms.

Implicitly,

$$MD = MD(P; k, y)$$

$$MS = MS(P; S, k, P_s, y)$$

$$Y = Y(P; y)$$

Explicitly,

$$MD = aP + by + ck \quad (1)$$

$$MS = eS + fk - gP_s - hP - jy \quad (2)$$

$$Y = Py \quad (3)$$

where MD , MS , S , k , y , and P_s are as defined previously. P is the price level, and Y is nominal national income. Furthermore, $a > 0$, $b > 0$, $c > 0$, $e > 0$, $f > 0$, $g > 0$, $h > 0$, $j > 0$, $l > k > 0$.

Assuming that $MD = MS = M$ and that M , P , and Y are the endogenous variables of the system, this becomes:

$$M - aP = by + ck \quad (1a)$$

$$M + hP = eS + fk - gP_s - jy \quad (2a)$$

$$Y - Py = 0 \quad (3a)$$

Setting this up in the matrix form $Ax = d$, one has the following:

$$\begin{bmatrix} 1 & -a & 0 \\ 1 & h & 0 \\ 0 & -y & 1 \end{bmatrix} \begin{bmatrix} \bar{M} \\ \bar{P} \\ \bar{Y} \end{bmatrix} = \begin{bmatrix} by + ck \\ eS + fk - gP_s - jy \\ 0 \end{bmatrix}$$

Solving for the determinant $|A| = (h + a) > 0$. Thus, there exists a unique and nontrivial solution to the system. Utilizing Cramer's Rule, one can solve for \bar{M} , \bar{P} , and \bar{Y} , the equilibrium values of M , P , and Y .

$$\bar{M} = \frac{|A_1|}{|A|} = \frac{\begin{vmatrix} by + ck & -a & 0 \\ eS + fk - gP_s - jy & h & 0 \\ 0 & -y & 1 \end{vmatrix}}{(h + a)}$$

$$= \frac{hby + ckh + aeS + afk - agP_s - ajy}{(h + a)}$$

$$\bar{P} = \frac{|A_2|}{|A|} = \frac{\begin{vmatrix} 1 & by + ck & 0 \\ 1 & eS + fk - gP_s - jy & 0 \\ 0 & 0 & 1 \end{vmatrix}}{(h + a)}$$

$$= \frac{eS + fk - gP_s - jy - by - ck}{(h + a)}$$

$$\bar{Y} = \frac{|A_3|}{|A|} = \frac{\begin{vmatrix} 1 & -a & by + ck \\ 1 & h & eS + fk - gP_s - jy \\ \emptyset & -y & \emptyset \end{vmatrix}}{(h+a)} = \frac{yeS + yfk - ygP_s - jy^2 - bky}{(h+a)}$$

To determine the effects of parametric changes, one may take the partial derivative of each \bar{M} , \bar{P} , and \bar{Y} with respect to k , y , S , and P_s . Please note that only the basic results are presented here. The details may be found in the Appendix.

A Change in k. If the fraction (k) of income that consumers desire to hold as money changes, then,

$$\frac{\partial \bar{M}}{\partial k} = \frac{(ch + af)}{(h+a)} > \emptyset, \quad \frac{\partial \bar{P}}{\partial k} = \frac{(f-c)}{(h+a)}$$

To maintain equilibrium,

$$\frac{\partial MD}{\partial k} = \frac{\partial MS}{\partial k}$$

or $c=f$. Therefore,

$$\frac{\partial \bar{P}}{\partial k} = \emptyset$$

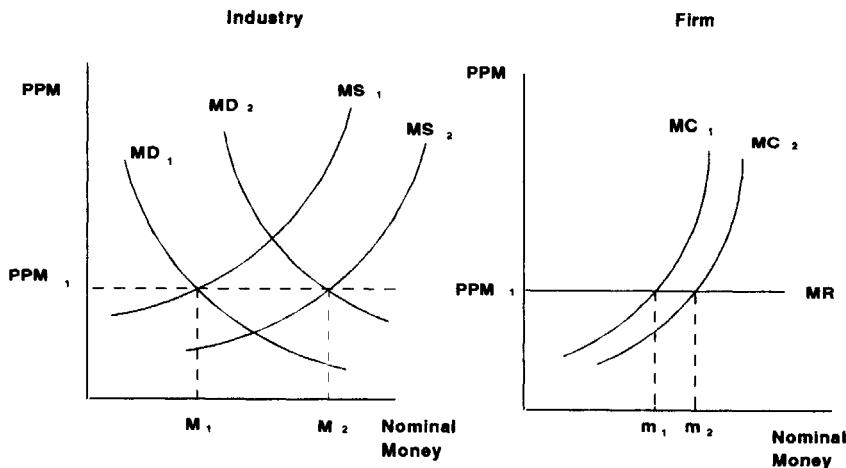
$$\frac{\partial \bar{Y}}{\partial k} = \frac{y(f-c)}{(h+a)} = \emptyset$$

To summarize,

$$\frac{\partial \bar{M}}{\partial k} > \emptyset, \quad \frac{\partial \bar{P}}{\partial k} = \emptyset, \quad \frac{\partial \bar{Y}}{\partial k} = \emptyset$$

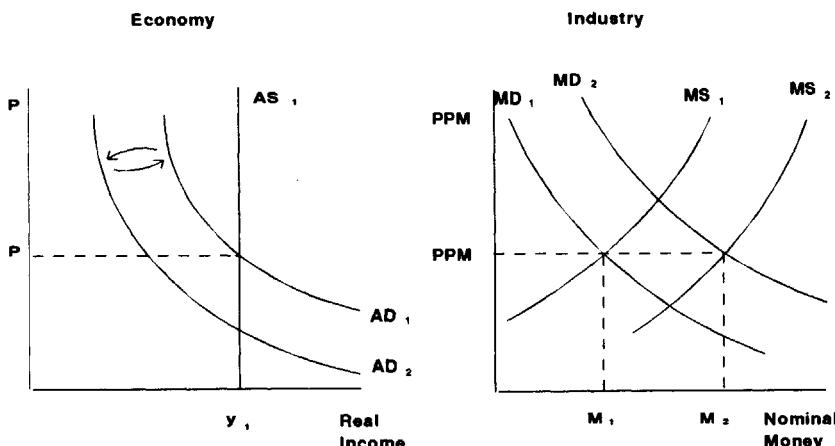
This scenario is illustrated in Figures 1 and 2. The demand for nominal money balances rises as k rises, but the increase in k also reduces the marginal liquidity costs of free banks, since less specie is needed to cover adverse interbank clearings, the volume and frequency of transactions having declined. This

Figure 1
Microeffects of an Increase in k



increases the money multiplier and, thus, the money supply. In macroterms, the increased demand for money reduces aggregate demand (AD), but aggregate demand rises again as the supply of money increases. The net result is that neither the price level nor income changes. However, nominal (and real) money balances are greater than before. Such an increase in money balances is in accord with the increase in k that was the premise of the case. In short, “free banks maintain constant the supply of inside money multiplied by its income velocity of circulation” (Selgin 1988a, 102). That is to say, free bank-

Figure 2
Macroeffects of an Increase in k



ing tends to maintain nominal national income in the face of a change in k . This result, as noted by Selgin (1988a, 56), may be termed a “neutral money policy” and has been advocated by economists such as Hayek (1935), William Hutt (1979), Dennis Robertson (1926), Pigou (1933), Gottfried Haberler (1931), and J. E. Meade (1933).

A Change in y . Turning to the effects of a change in real output/income brought about by an increase in productivity,

$$\frac{\partial \bar{M}}{\partial y} = \frac{(bh - aj)}{(h + a)}$$

To maintain equilibrium in the market for money,

$$\frac{\partial MD}{\partial y} + \frac{\partial MS}{\partial y} = 0, \text{ or } b = j$$

and

$$\frac{\partial MD}{\partial P} + \frac{\partial MS}{\partial P} = 0, \text{ or } a = h$$

Substituting,

$$\frac{\partial \bar{M}}{\partial y} = \frac{(jh - jh)}{(h + a)} = 0$$

$$\frac{\partial \bar{P}}{\partial y} = \frac{-(j + b)}{(h + a)} < 0$$

$$\frac{\partial \bar{Y}}{\partial y} = \frac{P(h + a) - y(j + b)}{(h + a)}$$

Following Selgin (1988a, 98–101; 1990, 272), who assumes that aggregate demand is unit elastic, then

$$\frac{\partial \bar{Y}}{\partial P} + \frac{\partial \bar{Y}}{\partial y} = 0$$

and since

$$\frac{\partial \bar{Y}}{\partial P} = 0,$$

then

$$\frac{\partial \bar{Y}}{\partial y} = \emptyset$$

Of course, if aggregate demand were elastic then $\partial \bar{Y}/\partial y > \emptyset$. Furthermore, if aggregate demand were inelastic, then $\partial \bar{Y}/\partial y < \emptyset$. Selgin suggests that if “the supply of labor is inelastic with respect to changes in productivity, then . . . changes in the price level should be fully proportionate to opposite changes in output” (1990, 272). That is the case assumed here. Thus,

$$\frac{\partial \bar{Y}}{\partial y} = \emptyset$$

To summarize,

$$\frac{\partial \bar{M}}{\partial y} = \emptyset, \quad \frac{\partial \bar{P}}{\partial y} < \emptyset, \quad \frac{\partial \bar{Y}}{\partial y} = \emptyset$$

These results are portrayed in Figures 3 and 4. The general improvement in productivity increases aggregate supply (AS) and real income, lowers goods' production costs, and exerts downward pressure on the price level. The increase in real income elicits an increase in the demand for money as well as a decrease in the supply of money. The net effects are a general decline in prices, no change in nominal income, and an increase in real money balances. This

Figure 3
Microeffects of a Decrease in Goods' Production Costs

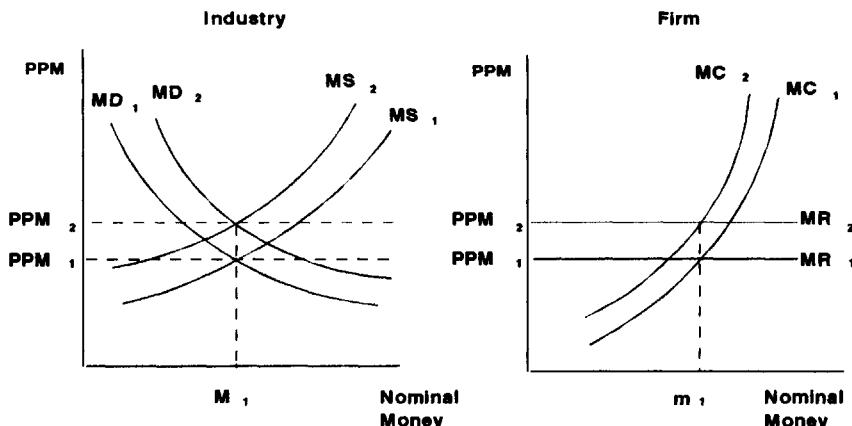
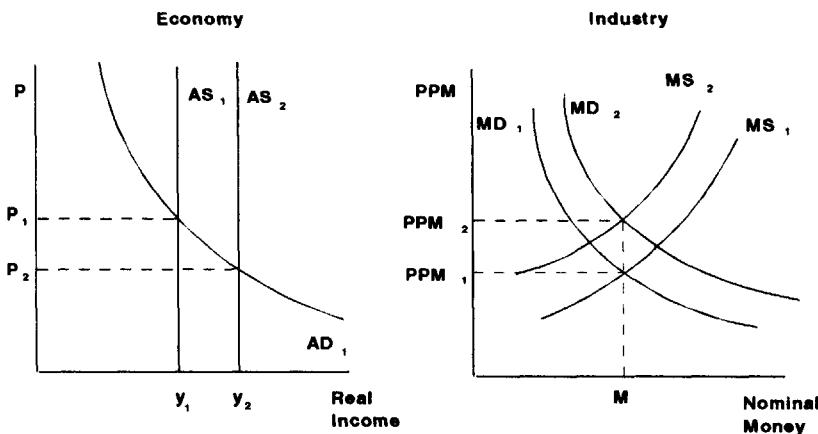


Figure 4
Macroeffects of a Decrease in Goods' Production Costs



last is necessary given that real income rises while k is constant. The reduction in goods' money prices raises the marginal costs of banks and, therefore, reduces the money supply. One may recall that this follows from the observation that free banks should perceive their marginal costs in real terms, that is, the goods and services required to produce an additional dollar and maintain it in circulation.

Selgin quite appropriately emphasizes at this point that "a 'neutral' monetary policy, one that maintains monetary equilibrium, is not likely to keep any price index stable. What is needed is a policy that prevents price changes due to changes in the demand for money relative to income without preventing price changes due to changes in productive efficiency" (1988a, 101). This free banking tends to do.

Two related problems appear in Selgin's treatment of the above sequence of events. First of all, as noted earlier, it is unlikely that this would include a real-balance effect of any consequence. Yet Selgin makes reference to such an effect (1988a, 101–2). Second, he is certainly correct to conclude that the nominal supply of money must contract in the face of a general productivity gain. However, he offers no sound explanation of why this would occur—unlike the present work. The explanation he offers is that "the nominal supply of inside money will adjust only in response to any change in spending associated with some real-balance effect" (1988a, 102). That is, if the rate of spending rises as an expression of a real-balance effect (k falls), then the money supply will fall, but this comes to nought as an explanation given that the real-balance effect will be small, if not nonexistent, under free banking.

A Change in S. To continue with the comparative statics analysis, one also must look at the effects of a change in the quantity of specie that forms the monetary base:

$$\frac{\partial \bar{M}}{\partial S} = \frac{ae}{(h+a)} > 0$$

$$\frac{\partial \bar{P}}{\partial S} = \frac{e}{(h+a)} > 0$$

$$\frac{\partial \bar{Y}}{\partial S} = \frac{ye}{(h+a)} > 0$$

There is nothing unusual here. An increase in specie—if it is held by banks as reserves—tends, *ceteris paribus*, to increase the money supply, the price level, and nominal income. The increased inside money supply results from the decrease in marginal liquidity costs implied by the greater specie reserves. This is shown in Figures 5 and 6. Admittedly, to the extent that such a sequence of events occurs, free banking might justifiably be termed “unstable.”

However, there is a distinction to be made that is of some importance. Selgin explains that a commodity-backed monetary system will be unstable because of short-run changes in the production of that commodity *only* if such bursts in production constitute exogenous supply shocks that are not merely reactions to a change in demand for the monetary commodity (1988a, 130). Furthermore, a review of the history of gold production suggests that “discoveries and improvements in extraction techniques are best understood as responses to increased demand for gold rather than as supply shocks” (Selgin 1988a, 131).

Redemption Runs. The destabilizing events described above and revealed in Figures 5 and 6 are the result of exogenous supply shocks. If Selgin’s research is to be believed, it is far more likely that an increase in the supply of specie would follow a shift in consumer preferences away from inside money and

Figure 5
Microeffects of an Increase in Specie Reserves

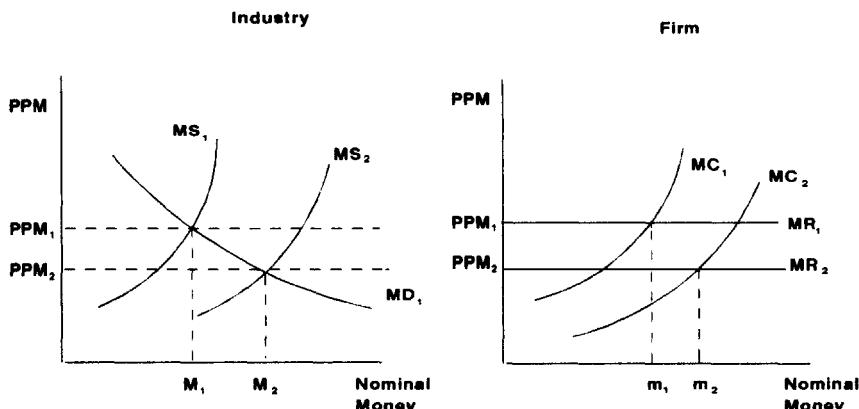
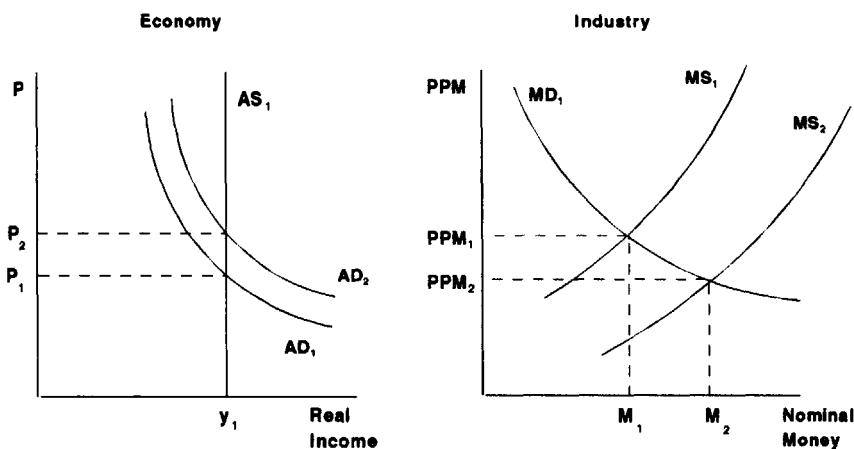


Figure 6
Macroeffects of an Increase in Specie Reserves



toward outside money, that is, gold coin. Michael Bordo (1984, 201), for example, seems to concur with this appraisal of the essential stability of gold production. In other words, an increase in specie would probably be preceded by a decline in k_i , k_i being the fraction of income one wishes to hold in the form of inside money, whereas the fraction of income one wishes to hold in the form of outside money might be termed k_o , with $k_i + k_o = k$. The fall in k_i decreases the demand for inside money and, at the same time, also decreases its supply by virtue of raising the marginal costs of banks.

Two points require clarification. Earlier it was assumed that k represented a money/income relation that referred only to inside money. Now one encounters k_i and k_o , one for inside money and one for outside money. The reason for the change is quite simple. Emulating Selgin, it was earlier assumed that no outside money was in circulation, it all being held by banks as reserves, that is, previously $k_o = \emptyset$. The present case is merely one in which outside money demand grows at the expense of inside money demand. Thus, $k_o > \emptyset$. It is, furthermore, important to recognize this as a classic “redemption run” on banks.¹⁸ That is, consumers liquidate part of their holdings of banknotes and/or checkable deposits and demand payment in specie. The conventional textbook explanation of redemption runs under central banking is that an increase in the demand for outside money reduces the total reserves of the banking system, which, in turn, brings about a multiplicative decline in the total money supply and a destabilizing deflation in the economy (Jaffee 1989, 341–42).

The increase in free banks’ marginal liquidity costs resulting from a preference shift toward outside money is, of course, due both to the higher real unit cost of specie and to the higher optimal reserve ratio, that is, the higher ratio of specie held per dollar of inside money in circulation, necessitated by the

decline in k_i . Together these changes suggest a large increase in marginal costs and a large decrease in the inside money supply. When the supply of specie subsequently increases—as a result of either improvements in extraction techniques or new discoveries, per Selgin—the marginal costs of inside money fall and the supply of that inside money rises. However, since by assumption k_i and k_o do not change further, the decline in marginal costs should be smaller than its earlier increase. That is, marginal costs will fall only because of the lower real unit cost of specie; the optimal reserve ratio will not also be lower.

Recall that it was earlier assumed that no outside money was in circulation. In such a case, $k_o = \emptyset$ and $k_i = k$. Mathematically, then, the effects of a change in k_i are such that

$$\frac{\partial \bar{M}}{\partial k_i} = \frac{(ch + af)}{(h + a)} > \emptyset$$

$$\frac{\partial \bar{P}}{\partial k_i} = \frac{(f - c)}{(h + a)} = \emptyset$$

$$\frac{\partial \bar{Y}}{\partial k_i} = \frac{y(f - c)}{(h + a)} = \emptyset$$

Furthermore, for changes in the real cost of specie (P_s),

$$\frac{\partial \bar{M}}{\partial P_s} = \frac{-ag}{(h + a)} < \emptyset$$

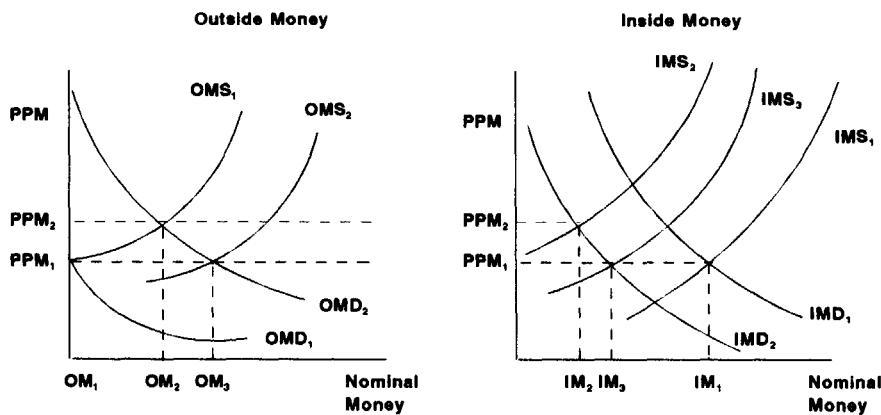
$$\frac{\partial \bar{P}}{\partial P_s} = \frac{-g}{(h + a)} < \emptyset$$

$$\frac{\partial \bar{Y}}{\partial P_s} = \frac{-yg}{(h + a)} < \emptyset$$

A decrease in k_i that is accompanied by an increase in both k_o and the price of specie P_s must, as a first effect, lead to a smaller nominal inside money supply. As long as the optimal reserve ratio remains less than 1, that is, as long as free banks hold fractional reserves, it must also be true that the decline in the inside money supply must exceed the increase in outside money—each change in specie reserves having a multiplicative impact on the inside money supply. In short, the total money supply, the price level, and nominal income must fall.

Such a scenario is depicted in Figures 7 and 8. There one sees the preference shift away from inside money and toward outside money. Outside money demand (OMD) rises as inside money demand (IMD) falls. Higher liquidity costs and higher reserve ratios combine greatly to reduce the inside money supply (IMS). The total money supply falls as does the price level and nominal in-

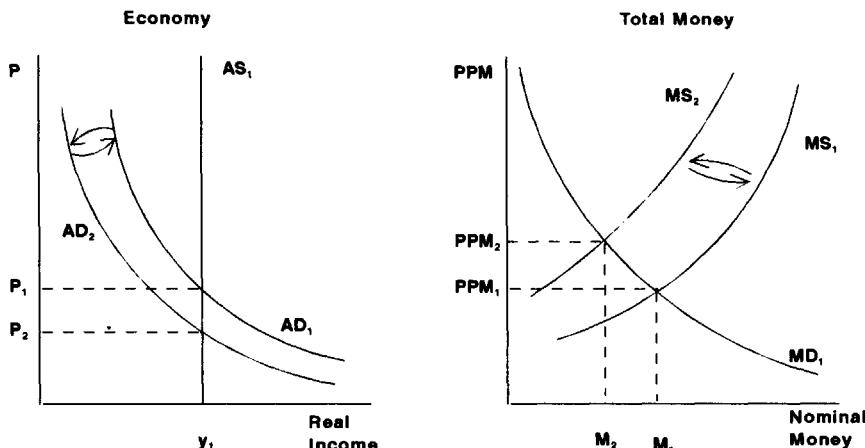
Figure 7
Microeffects of an Increase in k_o /Decrease in k_i



come. When, after some time lag, the supply of outside money (OMS) increases, liquidity costs fall back, and the inside money supply, the total money supply, the price level, and nominal income all rise again. As seen earlier,

$$\frac{\partial \bar{M}}{\partial P_s} < 0, \quad \frac{\partial \bar{P}}{\partial P_s} < 0, \quad \frac{\partial \bar{Y}}{\partial P_s} < 0$$

Figure 8
Macroeffects of an Increase in k_o /Decrease in k_i



and

$$\frac{\partial \bar{M}}{\partial S} > 0, \quad \frac{\partial \bar{P}}{\partial S} > 0, \quad \frac{\partial \bar{Y}}{\partial S} > 0$$

As conveyed by Figures 7 and 8, although the redemption run is indeed deflationary initially, the supply-side gains in the production of specie lead to an increase in the inside as well as the outside money supply. This tends to bring the price level back toward its original state. It therefore appears that free banking, once again, is self-correcting.

The obvious question arises, however, as to how long it will take for the specie production gains to take effect. Selgin seems inconsistent in his treatment of this time element. On the one hand, he makes reference to "short-run" changes in the gold supply (1988a, 129), whereas on the other hand he ascribes these changes to "discoveries and improvements in extraction techniques" (1988a, 131). The latter appear to belong more nearly within the domain of the economic long run than in the short run.

Why must one wait, however, for the long run to bring forth increased supplies of specie? Could not free banks simply—and quickly—purchase additional monetary gold from abroad? This is certainly White's position. He states that "as the public desires to hold a greater share of its currency in the form of specie rather than in notes . . . there will arise a short-run equilibrating tendency for specie to flow in from outside the region" (1984a, 12). Thus, the self-correction discussed above is likely to be short-run rather than long-run in nature.

Finally, one cannot help but be mystified by Selgin's assertion that "only exogenous changes in output, which imply a shift in the supply schedule of gold (rather than mere movement along the supply schedule) support the conclusion that gold output has been unstable" (1988a, 130). As seen earlier, it is precisely the movement along the supply curve of monetary gold that leads to a destabilizing deflation, and it is the supply curve shift that tends to bring prices back up to their earlier level. The distinction may not be crucial, but Selgin seems to have things backward.

Currency Runs. The ramifications of a redemption run have just been explored in some detail. Yet there remains a similar—but subtly distinct—issue that must be discussed: the effects of a "currency run." This is a shift of consumer preferences away from deposit account credits and toward currency. That is, consumers liquidate part (or all) of their demand deposits so as to acquire cash instead.

Currency runs reveal a dramatic inherent advantage that free banking possesses over central banking. Under central banking, the liabilities of the central bank, for example, Federal Reserve notes, are held both by the public as the sole legal currency and by commercial banks as a part of their reserves. Therefore, any change in the composition of the demand for money (the ratio of currency to deposits) will result in a multiplicative change in the money supply

in the opposite direction (Mishkin 1989, 317–18). Under free banking, however, currency is *not* a reserve asset of the bank but a liability—at least if one refers to inside currency. Thus, for a free bank to satisfy its customers' desire for relatively greater currency holdings and relatively smaller deposit holdings, it only needs to substitute one liability (its own notes) for another liability (deposit credits). There need not occur any decrease in reserves or any decrease in the total money supply.

It is simple to convey this contrast in formal terms. Under a central banking structure, the money supply (MS) may be defined, quite conventionally, as the sum of currency held by the public (C) plus demand deposits (DD), whereas the monetary base (MB) equals the sum of currency held by the public plus reserves held by banks (R). That is, $MS = C + DD$ and $MB = C + R$. If the statutory reserve ratio is RR, with $RR < 1$, then $RR = R/DD$ or $DD = R/RR$. Therefore, substituting the expression for DD back into the earlier expression for MS,

$$MS = C + \frac{MB - C}{RR} \text{ and } \frac{\partial MS}{\partial C} = (1 - 1/RR) < 0$$

This last is clearly negative as long as $RR < 1$, that is, as long as there is fractional reserve banking. For example, if the legal reserve ratio is 0.1 and consumers exchange \$1 million in deposit credits for \$1 million in currency, for any given monetary base, the net effect on the money supply will be a decrease of \$9 million. One should be cognizant of the essential problem facing a central banking system in this context: All currency runs necessarily are also (deflationary) redemption runs. This is a serious flaw in central banking that is ineradicable as long as competition in the supply of currency is forbidden.

The absence of such a problem under free banking may be formalized in the following equally simple way. Assuming, as initially, that no outside money is in circulation, then the money supply (MS) is the sum of private banknotes (N) held by the public plus demand deposits (DD), and the monetary base is the stock of specie (S) held by banks. Thus, $MS = N + DD$ and $MB = S$. If OR_N is the optimal reserve ratio for notes, OR_{DD} is the optimal ratio for demand deposits, S_N the specie reserves for notes, and S_{DD} the specie reserves for deposits, then

$$OR_N = \frac{S_N}{N} \text{ and } OR_{DD} = \frac{S_{DD}}{DD}$$

or

$$N = \frac{S_N}{OR_N} \text{ and } DD = \frac{S_{DD}}{OR_{DD}}$$

If one assumes that all free banks exhibit the same optimal reserve ratios for all deposits and notes, then $OR_N = OR_{DD} = OR$. Keeping in mind that specie reserves can be used to redeem either notes or deposits, the above expression for the money supply may be transformed such that

$$MS = N + DD = \frac{S_N + S_{DD}}{OR} = \frac{S}{OR}$$

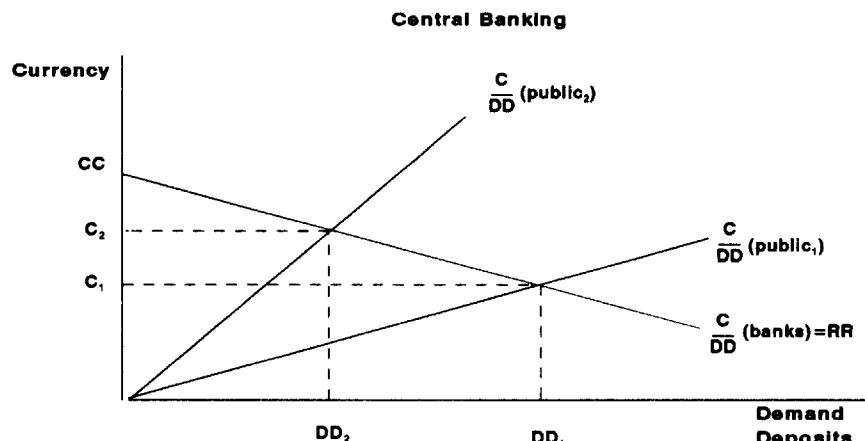
Thus,

$$\frac{\partial MS}{\partial N} = 0$$

That is, an increased demand for currency (banknotes) has no net effect whatever on the money supply. Currency runs pose no threat to free banks and do not imply deflation for the economy,¹⁹ unlike the case of central banking.

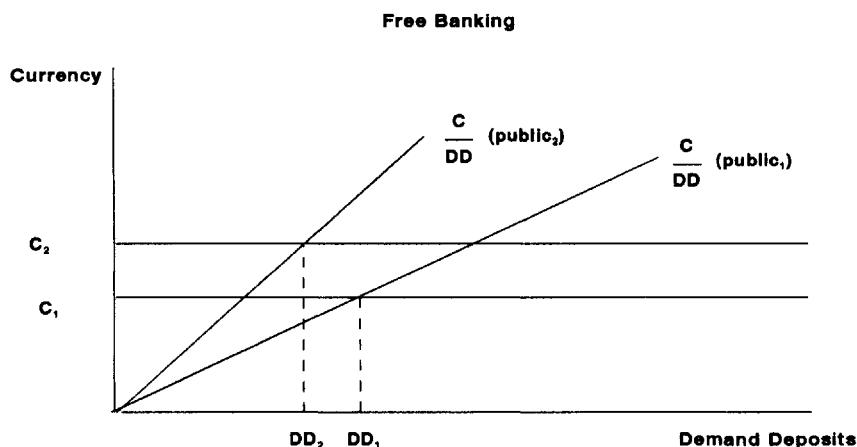
The contrasts between central banking and free banking in the context of a currency run are seen in Figures 9, 10, and 11. The first two of these figures are adapted from Pesek and Saving (1968, 193). In Figure 9, under central banking, an equilibrium position is achieved at a point where the desired currency/demand deposit ratio for consumers equals the currency/demand deposit ratio for banks, that latter ratio being equal to the statutory reserve requirement (RR). Assuming that both the legal reserve ratio and the total quantity of cur-

Figure 9
Effects of an Increase in the Relative Demand for Currency (Central Banking)



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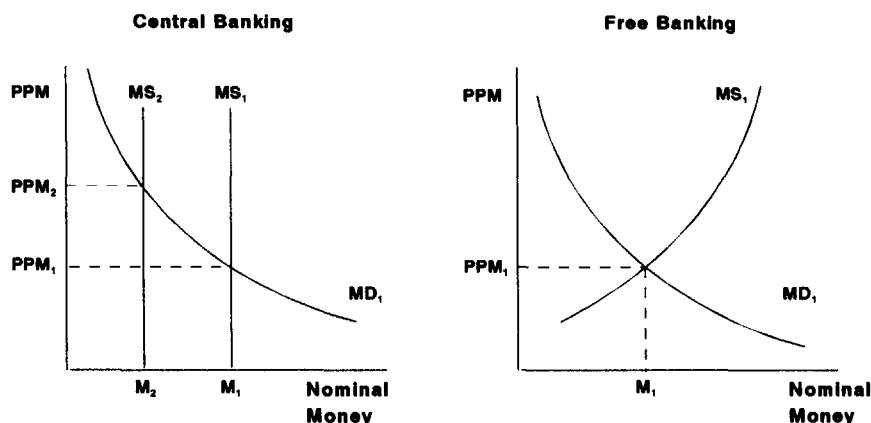
Figure 10
Effects of an Increase in the Relative Demand for Currency (Free Banking)



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rency in the economy (CC) remain constant, one sees that an increased relative demand for currency on the part of the public brings about a large decrease in total demand deposits and a proportionally smaller increase in currency held by the public. Thus, the net effect is a decrease in the total money supply. Figure 10, on the other hand, reveals that under a free-banking structure, firms can supply the desired additional currency to consumers without depleting their reserves and, therefore, without causing a net decrease in the overall money supply. The decrease in demand deposits may be matched by an increase in

Figure 11
Price Effects of an Increase in Relative Currency Demand



currency so as to avoid any net change. This ability of free banks derives from (1) their legal right to print their own currencies and (2) the absence of statutory reserve requirements. Figure 11 simply contrasts the likely deflationary effect of a net decline in the money supply brought about by a currency run (central banking) with the absence of such an effect (free banking).

SUMMARY

The purpose of this chapter has been to translate the White-Selgin approach to free banking into a formal model that, it is hoped, can be used both to illuminate the essence of that approach and to convey its characteristics to students of economics.

The conclusions that emerged from the comparative statics analysis were as follows. If the Cambridge cash balance k increases, then the money supply as well as the demand for money increases so that equilibrium money holdings increase (which is consistent with the rise in k), but neither the price level, nominal income, nor real income changes. If there are productivity improvements such that real output/income increases, then the demand for money increases while the supply of money decreases. Equilibrium nominal money holdings are unchanged, while real money balances rise. The price level falls, but nominal income remains unchanged (assuming aggregate demand is unit elastic). If there is a sudden increase in monetary gold production that results in larger specie holdings by banks, then the money supply rises, as do the price level and nominal income, while real income remains constant. If—as Selgin argues is much more likely to occur than the preceding—specie productivity gains *follow* a shift in consumer preferences toward outside money at the expense of inside money (a redemption run), then the total money stock, the price level, and nominal income all first fall and then rise again back toward the original equilibrium conditions. Finally, if consumer preferences shift toward currency at the expense of demand deposits (a currency run), then under free banking, there is no net change in the money supply, the price level, or nominal income, whereas under central banking, the money supply, the price level, and nominal income all decline.

In short, free banking appears to be self-correcting in the important sense that, under several different scenarios, profit-maximizing action on the part of banks will, even in the short run, tend to *Maintain nominal national income*. The one clear exception, an unprovoked and unanticipated gold supply shock, seems seldom if ever actually to occur. In other words, the “invisible hand” of Adam Smith is revealed when banking is made truly competitive.

The question remains as to how actual episodes of free banking would perform. Regrettably, there are no historical cases of a “true” or “pure” free-banking regime from which one might draw unambiguous conclusions. However, there have been several experiments involving multiple issuers of banknotes, from which one can glean some provocative material for review and

debate. The best documented of these are (1) Scotland (1765–1845) and (2) the United States (1837–1863). Chapters 5 and 6 are devoted to examinations of these cases.

First, however, there are certain additional theoretical issues to be addressed. Chapter 3 discusses Say's Law, business cycles, and the role of free banking in reconciling some well-known cycle theories. Chapter 4 argues that central banks face insurmountable problems that prevent them from maintaining stable economic conditions.

NOTES

1. The case Selgin discusses is that of freezing the quantity of Federal Reserve notes. Basing a free-banking system on such a fiat currency appears to be, as he admits, very much removed from the specie-based system he examines throughout most of his book. Nevertheless, Selgin insists that the differences are not large.
2. In an earlier article, J. H. G. Olivera demonstrated that the numerical value of such elasticity must lie between 0.5 and 1.0 (1971).
3. See the discussion of parametric effects later in the chapter. Also, it is difficult to imagine that the supply of specie would ever be perfectly elastic.
4. A bank's reputation for redemption is here taken to be an asset of the firm (part of its "brand name capital") that is developed over the long run and that, therefore, is a given in the short run. Many economists would, no doubt, argue that "reputation" is an ephemeral thing that can vaporize in an instant during a bank "panic." They err in reasoning from what is true in central banking to what (they think) would be true of free banking. Contagion effects, as they are called, are much less likely to occur under free banking. For evidence on the absence of contagion in American free banking, see Arthur Rolnick and Warren Weber (1986).
5. For examples of the Austrian position, one should consult Murray Rothbard (1970, 277–78), O'Driscoll and Mario Rizzo (1985, 121), and Mises (1966, 350–57).
6. The reader should *not* assume that all the economists mentioned in this paragraph would categorize themselves as Austrians.
7. The author, although in agreement with their policy prescriptions and very sympathetic to their methodological stance, does not accept the categorical dismissal of all math and statistics espoused by many Austrians. It is ironic that some Austrians condemn any mathematical, graphical, or statistical work undertaken by non-Austrians, but indulge in it themselves on occasion. See Rothbard (1970; 1975) and Roger Garrison (1978) for examples of the insightful use of graphs and/or statistics by well-known Austrians.
8. Say took "money" to mean only specie, that is, only outside money.
9. Alternatively, one may think of banking as a "contestable" market (Baumol 1982).
10. In this system, the medium of exchange and unit of account are coextensive. See Chapter 7 for a discussion of versions of free banking in which they are divorced from one another.
11. In reality, of course, there is not a single interest rate, but an array of interest rates.
12. Some economists argue that money has neither a market nor a price of its own (Yeager 1986, 377). Their conclusion stems from the observation that, since money

trades against goods and services in a multitude of markets, the price of money (its purchasing power) does not instantaneously adjust to changes in the supply of or demand for money. One need not challenge the accuracy of that observation in order to maintain that (conceptually) money has a market and a price. This is especially true if one thinks of the price level as the array of goods' relative prices rather than as their weighted average.

13. This is not meant to deny that there are problems inherent in the use of any price index. All that is being suggested is that the concept "price level" is useful pedagogically.

14. There are, however, some departures from Selgin, as will be seen.

15. They are not ignored altogether, however. Chapter 3 discusses the interest rate effects of the parametric changes dealt with here.

16. Legal constraints (the Banking Act of 1933, also known as the Glass-Steagall Act) are the only reason for the long-standing absence of interest-bearing demand deposits in the United States.

17. An obvious possibility would be the issuance of notes subject to an option clause.

18. Since free banks would have a profit incentive to maintain redeemability and to nurture consumer confidence in that redeemability, it seems unlikely that redemption runs would occur with any frequency in a free-banking regime.

19. This is certainly true as long as the currency run does not degenerate into a redemption run. Even then, as discussed earlier, it is likely that free banking would prove to be self-correcting.

Chapter 3

SAY'S LAW

The question of which monetary regime is optimal has several facets. Ethically, the question may be about which regime is consistent with a “rule of law,” procedural justice, and individual rights. Socio-politically, one may ask which regime minimizes rent-seeking behavior on the part of special interest groups. In a technical economic sense, one may inquire as to which institutional structure minimizes the destructive effects of business cycles. This chapter will examine the relationships between free banking and cyclical stability.

BUSINESS CYCLES

Just what are business cycles? At the most basic level, cycles are evidence of market *discoordination*.¹ In the expansionary phase (the “boom”), there exists, in the aggregate, an excess demand for goods. That is, resource owners, for example, laborers, demand goods whose market value exceeds the value of the resources the individuals supply. During the contractionary phase (the “recession”), there is, in the aggregate, an excess supply of goods. Resource owners supply resources whose value exceeds the market value of the goods demanded. The value of resources supplied may be taken to mean those goods one could potentially purchase with the income generated by the sale or rental of one’s resources. This Steven Horwitz calls “notional demand”; he terms the value of goods actually demanded “effective demand” (1990, 8). In a barter economy, there can exist no difference between effective demand and notional demand. However, when there is one good that is more marketable than any other and, therefore, is more or less universally accepted as an exchange medium (money), then a rift can develop between effective and notional demands. Notional demand is translated into effective demand via money. If the money

supply is deficient, notional demand exceeds effective demand. If the money supply is excessive, effective demand exceeds notional demand.

What, then, is necessary in order for effective demand to equal notional demand? In other words, what is necessary in order to avoid business cycles? The necessary—but not sufficient—condition is monetary equilibrium. Real factors may still upset individual markets, but as long as monetary equilibrium prevails, the effects of these real shocks will be minimized. “What monetary equilibrium does is to allow for the most coordination possible at the microeconomic level by ensuring that the supply of inside money is correct” (Horwitz 1990, 9).

Two questions could be raised at this juncture. First, how should one define monetary equilibrium? George Selgin (1988a), Horwitz (1990), Leland Yeager (1986), and Yeager and Robert Greenfield (1989), for instance, all suggest that monetary equilibrium exists when the supply of money equals the demand for money at the prevailing level of prices. For Selgin, at least, this is rather problematic. To use such a definition seems contrary to his analysis of the effects of a pervasive productivity gain.² Such a gain in productivity decreased goods’ production costs and, in turn, the price level. Money supply and money demand were *not* equated at the prevailing level of prices, but at a new, lower level.³

Perhaps a better definition would be that monetary equilibrium occurs when the supply of money equals the demand for money, given the underlying state of general productivity and the concomitant price level. Improvements in productivity would warrant a decline in the price level, and retrogressions in productivity would require a rise in the price level. If, on the other hand, either (1) the income velocity of money or (2) the composition of money demand were to change (with no change in productivity), then no alteration in the price level would be necessary. Aggregate nominal money balances would remain constant in the face of either a change in the composition of money demand or a change in productivity. Money balances would vary inversely with changes in money’s income velocity.

Second, most economists perceive issues regarding money supply and money demand as fundamentally and ineluctably *macroeconomic* in nature. Yet, as cited above, Horwitz refers to these as problems of *microeconomic* coordination. There is a profound clash of perspectives at work here. Those who perceive an economy as blocks of aggregates and the task of the economist as the manipulation of those aggregates will think of money in a macrocontext. Those who perceive an economy as a multitude of interacting individuals possessed of imperfect knowledge and the task of the economist as the understanding of that interactive discovery process, will think of money in a microcontext. The perspective adopted here is that money is a microissue that has profound macroimplications.⁴ To pursue this point, one should consider Horwitz’s comments that

it is relative prices that guide actors in their allocative decisions in the market. What prices do is allow actors to coordinate their actions . . . prices reflect and convey knowledge . . . competition allows this knowledge to be passed in the market through acts of buying and selling. . . . What economies "do" is coordinate actions through prices. With this view, it is easy to see why macroeconomic problems are really microeconomic problems. (1988, 32)

Macroeconomic discoordination is the result of microeconomic discoordination. Many factors can bring this about: price controls, trade barriers, licensing requirements, antitrust statutes, taxes, subsidies, and so forth. However, the one occurrence that most frequently causes the most severe microeconomic (and macroeconomic) disruptions is monetary disequilibrium. This brings one back to an earlier point. To sustain monetary equilibrium is to minimize market discoordination, minimize the departures of effective demand from notional demand, and minimize both the frequency and severity of business cycles.

This, however, must be a concept of monetary equilibrium that takes into account changes in productivity. Otherwise, such "equilibrium" can actually be disruptive. For instance, if productivity rises, then a price-stabilization approach to monetary equilibrium would require an increase in the money supply to prevent a decline in the price level. This would pose at least two problems for the economy. First, since unit production costs would be falling, this would manifest itself as an (apparent) increase in firms' profits. Those extra profits will be eliminated, however, as marginal factor costs are bid up because of the rise in marginal productivity. Firms would face a "signal extraction" problem. The "hidden inflation" caused by the policy of maintaining prices at their former level would lead producers first to overexpand and then sharply contract production. Second, a productivity norm (which would be characteristic of free banking) requires fewer relative price changes than does price level stabilization. Selgin constructs a simple example of three factors of production and 1,000 final goods (1990, 275–76). Given certain plausible conditions, the productivity norm would require only one adjustment: a decline in the price of that good regarding which productivity had increased. In contrast, to keep the price level stable under the same circumstances would necessitate changes in the prices of 999 final goods as well as the three factors of production. Moreover, to maintain monetary equilibrium in the context of productivity changes will tend to keep effective demand equal to notional demand. It is this approach—and this only—which is fully consistent with Say's Law.

CLASSICAL ECONOMICS

Surely the single unifying theme of classical economics was that set of propositions subsumed under the title of "Say's Law." Named after the French economist Jean-Baptiste Say, who did much to popularize the work of Adam

Smith in Europe, this principle has twice been the focal point of intense, even acrimonious, debates in economics.⁵ First in the 1820s, early proponents of free markets, such as Say, James Mill, and David Ricardo, defended the validity of Say's Law against critics, such as Thomas Malthus, Jean Simonde de Sismondi, and James Maitland (Earl of Lauderdale).⁶ A century later, in the 1930s, the critics included John Maynard Keynes, John Hicks, Alvin Hansen, and Joan Robinson. The defenders of Say's Law at that time included Ludwig von Mises, F. A. Hayek, Lionel Robbins, D. H. Robertson, and William H. Hutt.

Thomas Sowell offers a lucid summary of this principle:

The basic idea behind Say's Law is both simple and important. The production of goods (including services) causes incomes to be paid to suppliers of the factors (labor, capital, land, etc.) used in producing the goods. The total price of the goods is the sum of these payments for wages, profits, rent, etc.—which is to say that the income generated during the production of a given output is equal to the value of that output. An increased supply of output means an increase in the income necessary to create a demand for that output. Supply creates its own demand. (1972, 4)

Of course, here the terms supply and demand do not refer to the supply of or demand for a specific good, but to aggregate supply and aggregate demand. That is, Say's Law suggests that the supply of goods in general creates demand for goods in general, or to revert to terminology used earlier, notional demand creates its own effective demand. There has been little argument over the proposition that notional demand can *potentially* create its own effective demand (Sowell 1972, 36). The question has long been: Will notional demand *actually* create its own effective demand?⁷ If so, under what conditions will this be true?

The contrast between actual and potential results is manifest in the various forms (or subpropositions) of Say's Law. Sowell identifies these as Walras' Law, Say's Identity, and Say's Equality (1972, 34–35). Say's Equality states that, if there is equilibrium in *all* markets (goods markets, factor markets, and the market for money), then the nominal value (money prices times quantities) of goods supplied will equal the value of goods demanded. This reveals the classical concern with disproportionality in specific markets, for example, the labor market (Hutt 1979, 135–77). Say's Equality establishes that notional demand will equal effective demand if a matrix of equilibria prevails. Say's Identity adopts a long-run perspective in which there is neither excess supply of nor excess demand for money. This proposition asserts, therefore, that the nominal value of goods supplied is identical to the nominal value of goods demanded. This, then, is merely a general long-run tendency. Walras' Law states that the sum of the value of goods supplied plus money supplied equals the sum of the value of goods demanded plus money demanded. ‘It implies that an excess quantity of goods supplied is the same as an excess demand for money’ (Sowell 1972, 34).

Walras' Law cuts to the heart of the matter. If monetary equilibrium (as defined earlier) holds, then there can be no monetary disturbances that might fuel a business cycle. The only possible disruptive influence will be real shocks that cause temporary disequilibria in specific markets. If monetary equilibrium is maintained more or less continuously, then such real shocks will have neither pervasive nor lasting effects. Effective demand will tend to equal notional demand (micro- and macroeconomic coordination will be maximized) as long as the market for money is in equilibrium. Therefore, properly understood, Say's Law is not (and never was) an unconditional proposition, but a conditional one. Given monetary equilibrium, the expected value of the difference between effective demand and notional demand equals zero.

The microeconomic aspects of Say's Law seem to be largely forgotten or ignored these days, but that was not always the case. Benjamin Anderson, writing in 1949, commented on Say's Law in the following manner:

The doctrine that supply creates its own demand . . . assumes a proper equilibrium among the different kinds of production, assumes proper terms of exchange (that is, price relationships) among different kinds of products, assumes proper relations between prices and costs. . . . Moreover, the money and capital markets must be in a state of balance. When there is an excess of bank credit used as a substitute for savings . . . or when the total volume of money and credit is expanded far beyond the growth of production and trade, disequilibria arise. (1979, 385–86)

Anderson touches on several key points. He stresses the microfoundations upon which Say's Law was constructed.⁸ He notes that there must be a “proper relation” between prices and costs. The reader will recall that the productivity norm approach to monetary equilibrium (as under free banking) will maintain such a proper relation, whereas a stable price level rule will not necessarily do so. Finally, he emphasizes the importance of “balance” (equilibrium) in the money and credit markets, and expresses particular concern for the case in which credit “substitutes” for savings.

TIME AND MONEY

Horwitz suggests that sound macroeconomic analysis must focus on the coordination process that occurs in specific markets (1990). In other words, the microfoundations must precede the macroconclusions. It is difficult to challenge such an assertion with any seriousness. Expanding on Roger Garrison's reference to time and money as “the universals of macroeconomics,”⁹ Horwitz further argues that “such analysis will have to consider the two most pervasive economic goods—time and money. A coordination-oriented macroeconomics would focus on movements in the markets for time . . . and money” (1990, 1). In more conventional terms, of what do the market for money and the market for time consist? The money market involves the supply of and demand

for money, the purchasing power of money (its price, the inverse of the price level), and banking. The time market involves savings and investment, the natural rate of interest, the supply of and demand for credit, market rates of interest, and banking.¹⁰

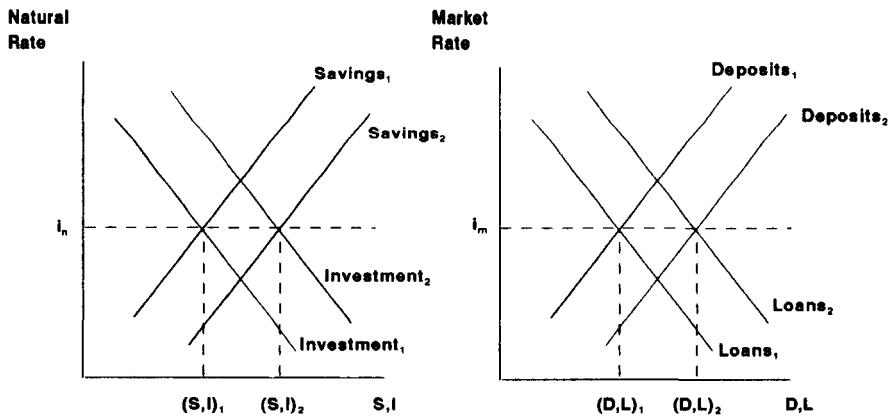
What is unique and important about free banking on a convertible specie standard is the relationship between the money and time markets.¹¹ As both Selgin (1988a, 54–55) and Horwitz (1990, 4–6) argue, the demand for inside money represents voluntary (not forced) savings on the part of consumers. Consumers let their cash balances rise by choosing to refrain from acts of consumption. This is unavoidable as long as consumers must give up real goods in order to acquire money. In particular, by not redeeming the deposit accounts or banknotes they hold, consumers leave more specie reserves in the hands of banks, “which is equivalent to a very short term act of savings” (Horwitz 1990, 4). Furthermore, the demand for inside money is equivalent to the supply of loanable funds. This stems from the fact that banks make loans by crediting a customer’s deposit account. Unless the customer is (at least briefly) willing to hold that additional inside money, then no new loan can be created. Thus, the demand for inside money, voluntary savings, and the supply of loanable funds all move together.

The supply of inside money “represents investment” (Horwitz 1990, 5), because the “way that banks add to the money supply is through deposit/loan creation” (Horwitz 1990, 4). Furthermore, those deposits are created in response to investors seeking funds. So new inside money will only be created when investment demand rises. The inside money supply also represents the demand for loanable funds, since such funds take a monetary form in any nonbarter economy, and little or no outside money is in circulation (Selgin 1988a, 31). Thus, the supply of inside money, investment, and the demand for loanable funds all move together.

One may conceive of two markets: (1) the interaction of *ex ante* savings and *ex ante* investment, and (2) the interaction of the supply of and demand for credit (or loanable funds). The latter will be perceived by banks in the form of an interaction between deposits and loans. This follows from the realization that deposits represent the supply of credit and loans represent the demand for credit. The natural rate of interest is that which equates *ex ante* savings and *ex ante* investment, with savings assumed to be positively related, and investment negatively related, to that natural rate.¹² The market rate of interest is that which equates the supply of credit (deposits) with the demand for credit (loans). It is assumed that deposits are positively related and loans negatively related to the market rate.

Given the above relationships, one can illustrate the interest rate effects of those parametric changes dealt with in Chapter 2. Specifically, Figures 12, 13, and 14 reveal the impacts on the natural rate of interest (i_n) and the market rate of interest (i_m) of, respectively, an increase in k , an increase in productivity (decrease in goods’ production costs), and a preference shift toward outside

Figure 12
Interest Rate Effects of an Increase in k



money and away from inside money. As k rises (with productivity and real income constant), both the supply of and demand for inside money rise.¹³ Therefore, savings, investment, deposits, and loans all increase (Figure 12). As long as monetary equilibrium is maintained, the shifts of each pair of schedules will be equiproportional, since the time markets reflect the money market. The natural and market rates of interest remain constant and equal to one another. Also, these rates of interest keep pace with the price level, which also does not change in this instance. If productivity increases (with k constant), then (1) real income and nominal money demand rise and (2) the nominal money supply and the price level fall. As a result, in the markets for time, savings and de-

Figure 13
Interest Rate Effects of a Decrease in Goods' Production Costs

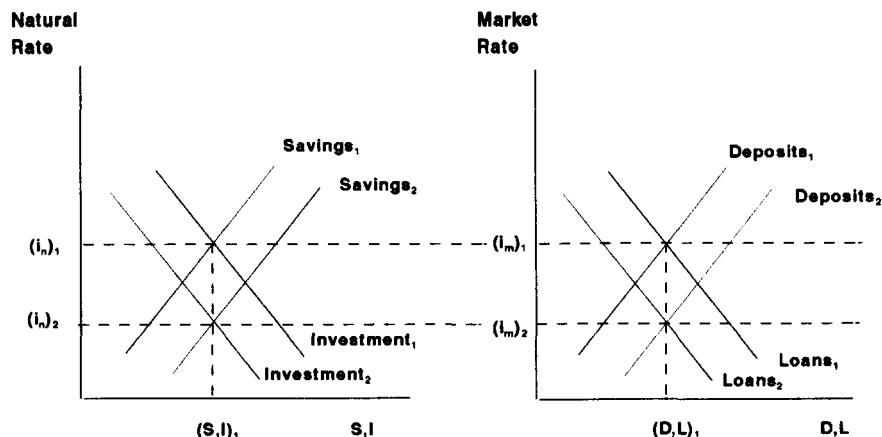
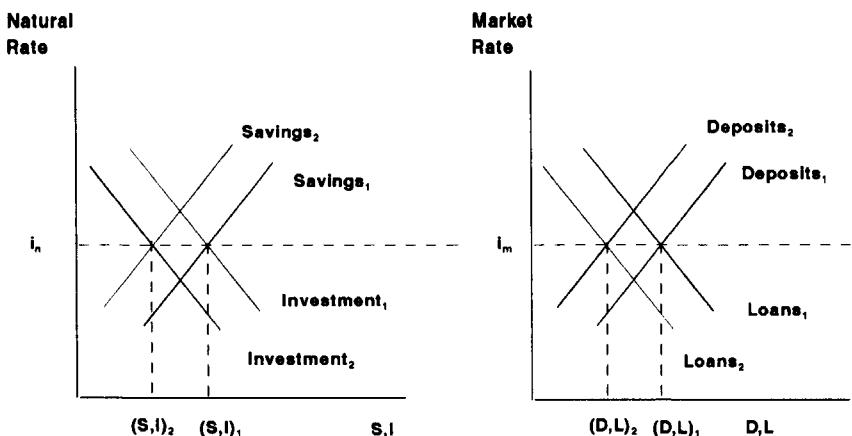


Figure 14
Interest Rate Effects of an Increase in k_o /Decrease in k_i



positis rise, while investment and loans decline (Figure 13). Both the natural and market rates decline and remain equal. If consumer preferences shift toward outside money (a redemption run), then there is a net decline in the inside money supply and inside money demand, with the price level exhibiting no net change. Thus, savings, deposits, investment, and loans all decline, and the natural and market rates remain, once again, constant and equal (Figure 14).

In short, under free banking, the time and money markets will remain in equilibrium individually and in relation to one another. Interest rates will track changes in the price level, and neither excess money nor excess credit will be created. There will be neither inflation nor unjustified deflation. Producers' profits will be neither artificially expanded nor artificially contracted. Perhaps most important of all, the market rate of interest will keep pace with the natural rate.

These conclusions bring one to confront the issue of business cycle theories. Reflecting upon free banking, two very provocative theses emerge. The first suggests that the dominant approach to business cycles is not instructive or even meaningful in a free-banking context. The second proposes that certain alternative approaches are, at root, either different facets of the same theory or, at least, complementary theories.

KEYNESIANS, MONETARISTS, AND AUSTRIANS

The set of propositions and policies known as Keynesianism completely dominated macroeconomics from the late 1930s to the mid-1970s. It took the appearance of inflationary recessions ("stagflation") during the 1970s to impel the economics profession to question the validity of those propositions.¹⁴ Even now, most economists seem to take for granted much of that which comprised

Keynesian thought.¹⁵ It is impossible in a short space to present Keynesianism in a fashion that does it complete justice (the same, of course, is true of the other schools of thought discussed below). Nevertheless, in order to grasp why the Keynesian critique of capitalism is irrelevant to free banking, one must have some idea of the fundamentals of that critique.

Keynesianism proposes that consumers may exhibit a sudden increase in their demand for money ("hoarding") as a result of, say, a lack of confidence regarding future economic conditions.¹⁶ Thus, consumption expenditures decline since consumers are saving more in the form of cash balances. *Ex ante* savings exceed *ex ante* investment. This has effects in both goods markets and factor markets. Consumer demand has fallen off, so producers experience an unwanted, *ex post* increase in inventory investment. That is, excess inventory accumulates. Assuming that nominal wage rates and goods' prices are generally "rigid downward," two things result: (1) producers cannot sell their surplus, so (2) they cut back on production by laying off workers. The free market has failed, and Say's Law is invalid. The government must come to the rescue via either fiscal or monetary policy. It may increase its expenditures so as to stimulate product demand and, thereby, the demand for labor,¹⁷ or it may increase the money supply such that the price level rises. This will reduce the *real* wage rate and increase the demand for labor.¹⁸

With free banking, however, an increase in the demand for inside money brought about by an increase in k will be matched by an increase in its supply. Equilibrium in the markets for money and time will be maintained. The Keynesian story of excess savings or underconsumption seems not to apply. As Horwitz puts it:

The only way general underconsumption could occur under free banking is if a significant loss of confidence in the banking system led to an unexpected demand to redeem liabilities in the reserve money. Such runs have been extremely rare in competitive systems. . . . Keynes's essential complaint is actually against not an oversupply of goods but an undersupply of money. . . . Keynes's complaints should not have been directed against Say's Law and the market per se, but against central banks. . . . Keynesian concerns are, at best, valid only in the absence of monetary competition. (1989, 429)

Two schools of economic thought that have presented powerful challenges to the Keynesian orthodoxy are the monetarists and the Austrians. Both espouse free markets, and both insist that disruptions in the market for money are the primary cause of business cycles. However, they differ—often bitterly—over certain specifics of policy as well as over fundamental methodological issues.¹⁹ Nevertheless, it will be seen that monetarists and Austrians tell business cycle stories that are either parallel or complementary, rather than contradictory.

Monetarism proposes that the demand for money is a stable and predictable function of certain variables: permanent income, the ratio of human to nonhu-

man wealth, the expected rate of inflation, and expected interest rates (Friedman 1971, 11–14). Furthermore, real output is, in the long run, determined by “real factors” (supplies of material resources, size of the labor force, per capita productivity, etc.). However, in the short run, real output may be affected by monetary conditions.

Since the demand for money is stable, any significant fluctuations in the money supply are likely to result in monetary disequilibrium and bring about macroeconomic disruption. Business cycles begin with an increase in the money supply such that the money supply exceeds money demand at the existing level of prices. As moneyholders spend their excess cash balances, prices rise. If the resulting actual rate of inflation exceeds the expected rate of inflation forecast by workers, then real wage rates fall, the demand for labor rises, and unemployment declines below the natural rate (assuming nominal wage rates are bid up by an amount less than the actual rate of inflation).²⁰ In order to maintain the low rate of unemployment, the rate of money growth and, thus, the rate of inflation must not only continue, but accelerate. Eventually the monetary authorities will become concerned about the rapidly rising inflation and begin to reduce the rate of growth in money (if they do not, then hyperinflation is inevitable). As the growth in money slows down, the rate of inflation falls. This fools workers in the opposite direction. The actual rate of inflation is less than the expected rate, real wage rates rise, and unemployment increases. In order temporarily to enjoy low unemployment, the society must first endure rising inflation and then, later, high unemployment.²¹ The expansion necessitates the contraction. Stability is regained when the actual rate of unemployment once again equals the natural rate of unemployment.

The monetarist focus is primarily on the markets for labor, goods, and money. In what seems to be a contrasting approach, Austrians concentrate on the markets for time, goods, and money. The basic Austrian analysis is as follows.

Money enters the economy not as “helicopter money,” that is, not as equi-proportional increases in everyone’s nominal cash balances, but in specific markets such that it brings about changes in *relative* prices. These relative price changes can be disruptive even if the overall price level does not change. The most important relative price is the price of credit—the market interest rate—which affects the extent to which there is intertemporal coordination.²² If the central bank increases the supply of bank reserves and, thus, the monetary base, and assuming that an increase in money demand did not precede the increase in reserves, then the result will be both an excess supply of money and an excess supply of credit.²³ Since goods markets often adjust more slowly than do financial markets, the market interest rate will tend to fall quickly, while prices of goods will rise, but more slowly.

The decline in the market interest rate is *not* a reflection of a decline in consumer time preferences, that is, consumers’ desired rate of consumption versus savings. Such a decline in the rate of time preference would have been manifested by an increase in the demand for money (increase in voluntary sav-

ings). What this means is that the natural rate of interest has not changed. Here is the crucial point for Austrians: Business cycles are the result of differences between the market rate of interest and the natural rate.

The lower market rate induces entrepreneurs to undertake additional investment projects.²⁴ Since voluntary savings have not increased, *ex ante* investment must exceed *ex ante* savings, but *ex post*, the two must be equal. This necessitates the appearance of "forced savings." "The forced savers are the existing holders of money. Their ability to consume is impaired by the influx of new purchasing power represented by the excess supply of money" (Horwitz 1990, 12). The demand for capital goods has increased, but the demand for consumer goods has not declined, because the boom in capital goods leads to greater incomes for the resource owners in that sector. This increase in incomes is spent primarily on consumer goods. The economy appears to be "booming." Sooner or later, however, entrepreneurs discover that the real resources necessary for their capital projects will not be forthcoming. Also, the prices of inputs rise as firms bid for factors of production. Profits, which at first appeared robust, begin to dwindle. The supply of credit declines, and interest rates rise, further reducing profitability. Projects are cancelled, workers are laid off, losses are incurred, and the recession follows. According to this Austrian malinvestment approach, the seeds of the recession may be found in the expansionary period, the fluctuations in the prices and production levels of capital goods will be greater than the fluctuations in the consumer goods sector, and stability returns when the market rate of interest once again equals the natural rate.

Both monetarists and Austrians place the primary blame for business cycles on central banks and their predilection for expansionary monetary policy. Monetarists emphasize the relations between the money supply and inflation, real wage rates, and unemployment. Austrians emphasize the effects of the money supply on credit markets, interest rates, and the structure of production. Both build their theories around unobservable variables: monetarists are concerned about departures from the natural rate of unemployment, and Austrians about departures from the natural rate of interest. Are these not two sides of the same coin? If the market rate of interest is less (greater) than the natural rate of interest, then surely it is also true that the actual rate of unemployment is less (greater) than the natural rate of unemployment. As unanticipated monetary expansion produces inflation, lower real wage rates, and increased employment, it must also bring about lower interest rates and greater production of both capital and consumer goods. Furthermore, when economic agents eventually perceive conditions correctly, the resulting increase in the expected rate of inflation will both (1) raise real wage rates and reduce employment, and (2) raise the market interest rate and reduce production. These may be argued to be two halves of the same basic theory. At the very least, they are complementary.

Any significant commonality between these two theories is usually denied vigorously by both sides. Nevertheless, this is not the first work in which par-

allels have been drawn between Austrians and monetarists. Horwitz (1990) deals sympathetically with both, and suggests that Austrians offer the more compelling analysis of inflation, but monetarists the better analysis of deflation. Thomas M. Humphrey goes so far as to declare that “monetarist and Austrian theories of the business cycle share many of the same or similar characteristics. Because of this, the two approaches should be seen as complementary rather than as competing” (1984, 19). More recently, Humphrey (1990) has argued that Knut Wicksell’s interest rate model (which forms the basis of much Austrian thinking) is quite similar to the monetary model of Irving Fisher (one of the most influential monetarists). Finally, it is interesting to notice that David Laidler, a well-known monetarist, describes “new-classical” economists²⁵ both as economists who wished “to restate monetarist analysis with greater rigour than its pioneers” (1990, 57) and as “neo-Austrians” (1982, 77–83).

SUMMARY

This chapter has discussed several related issues: Say’s Law, business cycles, and free banking. Business cycles were identified as fundamentally a problem of microeconomic discoordination, which resulted in a disparity between effective demand and notional demand. Say’s Law, or more precisely that version of it known as Walras’ Law, identified the likely source of the discoordination: money. The nature of free banking makes it manifestly clear that in a free market context, the markets for money and time are interwoven. That is, money affects both the markets for various present goods and services, and the inter-temporal market for present goods versus future goods. It was argued that free banking not only will tend to keep money in equilibrium, but also to keep the market interest rate equal to the natural rate. Finally, certain strong parallels were drawn between the monetarist and Austrian business cycle theories. It was suggested that these two theories are more nearly reinforcing than conflicting, despite the common belief to the contrary.

Chapters 2 and 3 have tried to present a theoretical foundation for the proposition that free banking tends to maintain monetary equilibrium, or alternatively, one might say that free banking minimizes business cycles (the expected value of the difference between effective demand and notional demand is zero). Can central banking do likewise? That is the topic addressed in Chapter 4.

NOTES

1. The discussion that follows owes much to the work of Steven Horwitz (1988, 1989, 1990). Horwitz has very skillfully articulated several ideas on which the author had himself been working independently.

2. See Chapter 2.

3. Of course, one might ask *when* this price level prevails. If money supply and money demand were to be equated at the price level that existed when the productivity

gains were first experienced, then money holdings would be excessive, and the spending of the excess would prevent the price level decline. Money supply and money demand must be equated at that price level that reflects the decrease in production costs caused by the gains in productivity. Selgin's is a "productivity norm" policy, not a policy of strict price level stabilization. His operative definition of "monetary equilibrium" should take account of the distinction. Those who opt for a stable price level as the preferred policy goal will want to retain a definition that makes no mention of productivity fluctuations.

4. One should note that the formal model of the previous chapter dealt with both micro- and macroaspects of the various parametric effects. Nevertheless, considerable aggregation was, admittedly, involved in the model. Much of the beauty of the complex matrix of individual interactions was traded for the crude simplicity of a mathematical model. Such a procedure seems fully justified pedagogically, at least as long as one does not fail to make it clear that the aggregates are the abstraction and the individuals are the reality.

5. Thomas Sowell (1972) presents a detailed, but very readable analysis of (1) the various interpretations of Say's Law and (2) the controversies surrounding it, particularly those of the early nineteenth century.

6. Later in that century, one of the most famous critics of Say's Law appeared—Karl Marx.

7. Alternatively, one might phrase this as: Will *ex ante* production actually equal *ex post* demand? As will be seen, there is a temporal aspect to this crucial question.

8. As Sowell puts it, "Classical economists referred to the restoration of equilibrium in terms of internal proportions, not aggregate quality (or value) of output" (1972, 36). Their primary concern was with microeconomic coordination rather than with the interactions of aggregates.

9. The author would be sorely tempted to add knowledge as the third universal. Is not economics fundamentally about the generation and use of knowledge, and is not time the dimension along which one searches for knowledge, and money the medium that conveys knowledge?

10. It should not be supposed that the discussion that follows reflects in every particular Horwitz's presentation of these issues.

11. It is assumed that there exist no legal constraints that artificially segment depository institutions into "commercial banks," "thrifts," and "credit unions." Therefore, the term "bank" here may be taken to represent any financial intermediary that accepts deposits. One should see Nicholas Lash (1987) for a succinct survey of restrictions on the financial services industry.

12. This is the conventional definition of the natural rate. An alternative, but equivalent, definition states that the natural (or "pure") rate is that which equates the supply of present goods (demand for future goods) with the demand for present goods (supply of future goods) (Rothbard 1970, 319–23).

13. See the discussions in Chapter 2 regarding this as well as the other two parametric effects dealt with here.

14. Some economists never found Keynes' thinking to be persuasive. These men—Mises, Hayek, Hutt, Robertson, et al.—defended Say's Law and free markets from the first appearance of Keynes' *General Theory of Employment, Interest, and Money* in 1936. In the last twenty years, criticism of Keynes has become both more common and

more diverse. The recent critics of Keynes include Milton Friedman, Murray Rothbard, and Robert Lucas, among many others.

15. The past tense is employed here because the appellation “Keynesian” has fallen out of favor. Those who subscribe to (modified versions of) Keynes’ ideas now call themselves “neo-Keynesians” or “post-Keynesians.”

16. The same general scenario can, per Keynes, be precipitated by a sudden decline in *ex ante* investment because of a loss of confidence on the part of entrepreneurs.

17. One may legitimately question whether the demand for goods is necessarily and proportionately a demand for labor.

18. This assumes a stable relationship between inflation and unemployment, that is, a stable Phillips curve tradeoff.

19. For example, one may say that, generally, Austrians favor free banking on a gold standard, and monetarists favor central banking with fiat currency but subject to some sort of strict monetary growth rule. As for methodology, Austrians are very skeptical of the use of mathematical models and econometric testing of hypotheses, whereas monetarists routinely construct formal models and undertake statistical tests.

20. This will likely be the case if either (1) workers form their inflationary expectations adaptively, that is, based purely on past trends, or (2) labor contracts are typically negotiated for long time periods, for example, for a two-year period.

21. In other words, the negative relation between inflation and unemployment applies to the short run, but becomes a positive relation in the long run.

22. Significant portions of the Austrian theory can be traced back to the work of Knut Wicksell.

23. As seen earlier, in an all-inside-money regime, an excess supply of money would represent an excess *demand* for credit, and such excesses would only be temporary phenomena.

24. Non-Austrians seem often to misunderstand this point. They interpret this to mean that business cycles are caused only by “low” interest rates (thought of in absolute terms). Austrians insist that what they mean is simply interest rates that are lower than they would have been in the absence of the monetary expansion (in relative terms). From an empirical standpoint, the problem is that the Austrians’ benchmark of stability, the natural rate of interest, is unobservable, but then, is not the natural rate of unemployment also unobservable?

25. New-classical economists assume that individuals’ expectations are formed “rationally” (people cannot be systematically deceived regarding the actual rate of inflation) and that markets clear continuously (economic agents never fail to take advantage of opportunities to increase their utility). These assumptions lead such economists to propose that government policies will seldom have any impact on real variables, such as the rate of unemployment or real output.

Chapter 4

MONETARY POLICY

At one level, the collapse of socialism seems, indeed, to be all around us. The Soviet Union and East Germany no longer exist. Poland and Romania have overthrown their Socialist hierarchies. The Berlin Wall is in pieces; the Iron Curtain seems irreparably torn. In many parts of the world, the rhetoric—if not the action—is that of the free market. Even the most dedicated leftists have ceased praising the traditional Socialist paradigm, that is, what one might refer to as “state socialism” or “comprehensive planning.” Of course, the economic fallacies that doom state socialism to failure were unmasked long ago by Ludwig von Mises (1981)¹ and Friedrich Hayek (1944; 1945). More recent critiques include those by Don Lavoie (1985), Hans-Hermann Hoppe (1989), and Hayek (1988). As a result, these fallacies, which lie at the heart of socialism, are now widely discussed, although they are, perhaps, still not thoroughly understood. What is being overlooked in the celebration of the retreat from state socialism is the fact that the thirst for planning continues to afflict many politicians, bureaucrats, and economists. The species socialism may be dead, or at least gravely ill, but the genus collectivism is alive and well.²

One manifestation of that collectivist spirit is what may be described as “noncomprehensive planning.” Unlike pure socialism, where the professed goal is to control every minute aspect of the economy, noncomprehensive planning hopes only to control one key sector or a few sectors, in order to direct the general path of the economy. By far the most important example of noncomprehensive planning is the monetary policy conducted by central banks.

Every first-semester economics student learns that money is unique in that it plays a role in virtually every transaction in a market economy. The phenomena affected by changes in the supply of or demand for money include interest rates, prices, wage rates, consumption and investment decisions, national in-

come, exchange rates, and the external trade balance. Furthermore, theorists as diverse as Milton Friedman (1959; 1968), Murray Rothbard (1975), Friedrich Hayek (1933; 1935; 1941), and Clark Warburton (1951; 1962; 1966) have pointed to monetary disturbances as the prime source of business cycles. It would seem clear that fluctuations in money reverberate throughout the economy.³ In short, the advocates of a centrally dictated monetary policy are in one sense too modest. To advocate such nominally noncomprehensive planning is, in fact, tantamount to proposing that there be bureaucratic influence upon the great majority of economic events. In another sense, they are, perhaps, too boastful. They seem always to assume that the relevant economic knowledge is (or will be) available to the monetary authorities.

The intent of this chapter is to argue that central banks are not only unwilling, but also—and this is the more radical proposition—*unable* to follow a rational monetary policy. First of all, several alternative monetary frameworks will be compared. Only one, the maintenance of monetary equilibrium under a productivity norm, will be seen to be optimal. Second, the insights of public choice theory will be utilized in order to reveal the typically perverse incentives of all monetary authorities. Finally, the work of various Austrian economists will form the foundation of an “impossibility argument.” It will be shown that, no matter what its incentives may be, no monetary authority can possess the economic knowledge it would have to have in order to maintain monetary equilibrium.

ALTERNATIVE POLICY GOALS

A multitude of possible monetary approaches have been proposed in recent decades. Most of these can be categorized as either a “rules” approach or a “discretionary” approach. That is, either bind the central bank to a specific objective from which it must not depart or grant the central bank the broad powers to follow any path it chooses to certain macroeconomic results. Enormous controversies have been generated regarding the alleged superiority of one over the other. As will be seen, the rules versus discretion controversy is not really relevant. To survey all such proposals would require a book-length treatment and, therefore, will not be undertaken here. Five of the more common proposals will be examined: (1) countercyclical actions to offset variations in employment and output, (2) the maintenance of a stable price level, (3) a constant rate of money growth rule, (4) a fractional-reserve gold standard, and (5) the maintenance of monetary equilibrium.

Countercyclical Policy

The objections to countercyclical actions have become familiar fare. It has been argued that attempts at stabilization will, more often than not, prove to be destabilizing. This seeming paradox has usually been explained by noting

(1) the long and variable time lags between the initiation of presumably countercyclical monetary actions, for example, the purchase or sale of government securities, and the resultant effects on the economy, and (2) the unreliability of econometric forecasting. Friedman has quite pointedly stated (and this hints at part of the argument in a later section) that even if the monetary authority were to choose a relatively noncontroversial task, such as achieving the natural rate of interest or the natural rate of employment, still the problem remains that

it cannot know what the "natural" rate is . . . And the "natural" rate will itself change from time to time. But the basic problem is that even if the monetary authority knew the "natural" rate, and attempted to peg the market rate at that level, it would not be led to a determinate policy. (1968, 10)

He concludes that countercyclical policy generally leads to either accelerating inflation or accelerating deflation, thus exacerbating the business cycle.

Hayek offers the related observation that "the present unemployment is the direct and inevitable consequence of the so-called full-employment policies pursued for the past twenty-five years" (1979a, 39). Hayek's assessment is grounded in the Austrian theory of the business (or trade) cycle,⁴ which argues that monetary expansion leads to malinvestments that must eventually be liquidated. When they are, unemployment rises. Many years of continuing expansion would create both a pervasive honeycomb of malinvestments and a chronic unemployment problem.

One should not overlook the "new-classical" position on countercyclical policy (Lucas 1973; 1975; Sargent and Wallace 1976). Theirs is a world in which agents utilize all available information and, as a result, cannot be systematically fooled by government actions. Any attempt to exploit a "Phillips curve tradeoff" by rapidly increasing the rate of inflation is doomed to failure. Individuals learn how policy makers react to certain economic conditions, and they adjust their inflationary expectations accordingly. Central bank manipulations of the money supply affect the price level, but have no net effect on real output or employment. In the new-classical approach, countercyclical actions are pointless.⁵

Considering the foregoing, one is driven to conclude that attempts at countercyclical policy (despite their enormous political popularity) have failed to attain their avowed object and/or often proven to be counterproductive.

Price-Level Stability

To maintain a stable price level has long been a popular proposal among many monetary economists. One of the most influential expositors of this notion was surely Irving Fisher (1920; 1963). At first glance, the concept appears unassailable. Nevertheless, despite its popularity, the idea of price level stabilization is not without its problems. Even such an ardent admirer of Fisher as

Milton Friedman has declared that seeking a stable price level is a suboptimal monetary goal. His major point seems to be that the connection between monetary movements and the price level, although a strong relation, is "not so close, so invariable, or so direct that the objective of achieving a stable price level is an appropriate guide to the day-to-day activities of the authorities" (Friedman 1962, 242).⁶

Moreover, it has been argued that to maintain a certain price level regardless of other conditions could introduce serious micro- and macroeconomic disturbances. George Selgin (1988a, 98–100; 1990) considers a constant price level in the context of a general increase in productivity. If the income velocity of money is constant, real income rises because of the productivity gains, unit costs of production fall, and the price level is to be held constant, then the money supply must rise. This causes nominal producer revenues to increase. Extranormal profits are made. In the opposite case of a decline in productivity, the money supply would have to fall, bringing about lower nominal revenues. Unusually low (perhaps negative) profits would be experienced.⁷ To put this in the terms used in Chapter 3, when productivity rises, effective demand exceeds notional demand; when productivity falls, notional demand exceeds effective demand (given a stable price level rule). A policy of maintaining a stable price level will, on occasion, be inconsistent with Say's Law (Selgin 1990, 281).

It must not be forgotten that price-level stabilization has little hope of even limited success unless a price index can be constructed that is a reliable and unambiguous indicator of actual prices. No thoughtful economist would deny that price indexes are less than perfect reflections of the structure of relative prices, but are they sufficiently reliable to be useful? Here there is a considerable divergence of opinion. Some few have argued that all index numbers are illegitimate and deceptive aggregations. Such economists insist that the price structure can never be revealed by a single number—however meticulous is its construction—but that, indeed, only the "array of prices in all their specificity" will suffice (Rothbard 1988a, 182–83; Mises 1966, 220–23).

Others have suggested that the practical problems associated with the construction of a meaningful price index are so nearly insoluble that one must despair of success in this endeavor. For example, Selgin has identified three key problem areas: (1) how to decide which goods to include in, and which goods to exclude from, the index, (2) what measure of central tendency to use in order to reduce the individual measures to a single number, and (3) how to assign weights to the specific prices (1988a, 97–98).

Such practical issues might be of minor importance were it not for the fact that each of the countless ways of resolving them (there is no obvious, right solution) leads to a different index which would, in turn, suggest a different schedule of money supply adjustments. Presumably, if any one schedule is correct for maintaining monetary equilibrium, the others cannot be. (Selgin 1988a, 98)

It is appropriate also to ask whether a stable price-level approach would suffer from the presence of nontrivial time lags regarding policy makers' responses. Ideally, one would need a price index that could be reconstructed and recalculated rapidly enough for the monetary authority to respond to every economic event of significance. Given the magnitude of the task, this would seem to be unlikely.

Richard Timberlake takes what one might describe as a cautiously optimistic position regarding the price index issue. He declares that "the conceptual validity of a price index seems logical . . . the validity of the concept cannot be denied because of the imperfection of the method used to measure it" (1987, 89). A price index "should be used, however, with caution and with an understanding of its frailties" (Timberlake 1987, 91). As is well known, those "frailties" include, for example, the quality, substitution, and housing biases from which the CPI suffers. Even elementary textbooks discuss such index number problems.

Timberlake's point is well taken. Index numbers can be *conceptually* useful. However, the issue at hand is not whether a price index is of value heuristically or pedagogically; the question is whether stabilization of a price index is both feasible and desirable as a benchmark for monetary policy. One must answer that question in the negative. The practical problems of constructing a proper index are enormous, and, in the context of productivity gains (or losses), a price-level rule could be destabilizing. A stable price level is certainly preferable to the inflation that seems always to accompany "full-employment" policies. Nevertheless, it remains a suboptimal monetary goal.

Constant Money Growth

If a price-level rule is less than ideal, then what of a constant rate of growth in money rule? This idea is, of course, closely associated with the work of Milton Friedman (1959, 77–99; 1962, 242–43; 1985, 5–7). The common form of the proposal is that the central bank, by means of manipulations of the monetary base via open market operations, should maintain a fixed rate of growth in some selected measure of the money stock, say M1. The goal is to produce a pervasively stable set of long-run economic conditions, with short-run fluctuations assumed to more or less offset one another. Friedman, as well as a number of other monetarists, proclaims this approach to be the optimal central bank policy in a world characterized by general uncertainty.

Nevertheless, a constant money growth rule (CMGR) faces several obstacles and objections. Most fundamentally, one must ask what measure of "money" is to be used. This is critically important, since the quantitative relation between the monetary base and M1, M2, and M3 is different in each case. That is, the respective money multipliers differ both conceptually and numerically. The linkage between the purchases undertaken by the central bank's open market trading desk and the growth of money can be quite sensitive to how one

defines money. Furthermore, it does not suffice to suggest that one simply always use that definition of the money stock that correlates most closely with some other macroeconomic variable, such as GNP or national income. To switch back and forth between various money measures would be likely to introduce considerable additional instability by means of increasing the uncertainty in the minds of market participants.⁸ The growth path of, say, GNP is not likely to be invariant relative to one's measure of money.

Moreover, switching monetary targets under a CMGR might gain nothing in another way. In order for a CMGR to work as planned, two conditions must be met. The intermediate target chosen (M1, M2, M3) needs both to have strong and predictable effects on some ultimate target like GNP and to be systematically affected by changes in the operating target (the monetary base).⁹ Only then can the central bank hope to smooth the long-run path of the economy by engaging in open market purchases of government securities, which change bank reserves and the monetary base. To switch money measures might improve the link between intermediate and ultimate targets, but the relation between operating target (the monetary base) and intermediate target (money) might well degenerate. For example, M2 might be more closely correlated with GNP than is M1 at the same time that M1 is more closely correlated with the monetary base than is M2. Changing targets from M1 to M2 might achieve nothing.

A CMGR also is not necessarily consistent with Say's Law. If the money supply increases by some fixed percentage that approximates the long-run *average* rate of change in productivity, then disequilibria may result. If, for example, productivity increases significantly so that production costs generally decline, then effective demand will exceed notional demand unless the rate of monetary growth falls.¹⁰ If productivity declines and production costs rise, notional demand will exceed effective demand unless the rate of money growth rises. Over the very long run, a CMGR would indeed keep *average* money growth in line with the *average* change in productivity, but this is not sufficient to escape business cycles.

Two assumptions that may be essential to a CMGR have been challenged. First, those who adopt this Friedmanite position appear always to assume that changes in the money stock are, in the long run, neutral with respect to real magnitudes (O'Driscoll and Shenoy 1976).¹¹ In contrast to this, one finds the literature of the Austrian school, in which it is argued that monetary manipulations are neutral in neither the short run nor the long run (Mises 1966, 538–86; Rothbard 1975, 11–38; Garrison 1978; Hayek 1933).

It is also assumed that aggregate money demand is a stable and predictable function. If this were not the case, then sudden fluctuations in the demand for money would bring about considerable instability in the form of monetary disequilibrium, despite the slow and steady growth in the money supply. The stability of money demand is, of course, open to question, especially if one is concerned with short-run as well as long-run conditions. For example, if the

interest rate on CDs rises relative to that on NOW accounts, then depositors will tend to transfer funds to CDs. That is, the demand for money—as measured by M1—will decline relative to the demand for “near money” (M2). To maintain a constant rate of growth in M1 would result in an excess supply of money. “Portfolio preferences could shift between actual money and near-moneys with extreme sensitivity to interest rates, causing important inflationary or deflationary effects even with the money supply constant” (Yeager 1968, 59).

Moreover, even if total money demand (however measured) remains absolutely constant, changes in the composition of money demand can have disequilibrating effects in the context of a CMGR. Specifically, consumers’ desired holdings of currency relative to demand deposits may change. If, for example, consumers decide to hold relatively greater quantities of currency, the result—in the absence of an offsetting increase in the monetary base—will be a multiplicative decline in the money supply (Friedman 1959, 66–67).

This is necessarily true of any central banking system in which there exist (1) fractional reserves and (2) a monopoly issuer of legal currency (Selgin 1988a, 113–15).¹² This fundamental problem arises because the single legal currency serves both as hand-to-hand currency for the public’s daily transactions and as part of the reserves of the banking system. Thus, an increase in currency demand constitutes a drain on reserves, which, through the familiar money multiplier process, brings about the net decrease in the money supply. The only solution is for the monetary authority to vary the monetary base as the composition of money demand varies.¹³ That, however, violates the essential idea of a CMGR (Friedman 1985).

Finally, Hayek has made an interesting observation about the Friedmanite proposal of a CMGR. Apparently inspired by a comment made by Walter Bagehot, Hayek expresses concern that panic conditions may occasionally be unavoidable under such a monetary rule. As he puts it, “I would not like to see what would happen if under such a provision it ever became known that the amount of cash in circulation was approaching the upper limit and that therefore *a need for increased liquidity could not be met*” (emphasis added) (1978, 77).

If there existed no superior approach, a CMGR—despite its flaws—might be a wise choice, but there is a preferable alternative. A CMGR is clearly suboptimal. Regarding the “discretion versus rules” debate over the proper conduct of monetary policy, Selgin speaks to the core issue:

These arguments for having a central bank adhere to a growth-rate rule are valid and compelling. But they do not see the issue as involving a choice between central banking and free banking. They offer what is perhaps the best solution to the problem of money supply *given that currency issue is to remain a government-controlled monopoly*. Nevertheless, *central banking, even when it is based on a monetary rule, is decidedly inferior to free banking as a means for preserving monetary equilibrium.* (emphasis in original) (1988a, 106)

A Gold Standard

There have been, and are, a number of different gold standards one might propose: a gold coin standard with 100 percent reserves, a gold coin standard with fractional reserves, a bullion standard with no coin in use, a gold exchange standard with general convertibility, or a gold exchange standard with convertibility limited to official institutions, such as under the Bretton Woods agreement (Bordo 1984, 198–99). The bullion standard constrains consumer choice by eliminating the possibility that consumers may seek liquidity in coin form. Furthermore, both versions of a gold exchange standard significantly violate the central idea of a gold standard: that there exists one base money (gold) that functions as both the reserves of banks and the basis for international transactions and (occasionally) is held by consumers. The gold/dollar exchange standard of Bretton Woods represented a serious dilution of the gold standard concept. Therefore, only the first two proposals will be considered here.

First consider a central banking system with 100 percent gold reserves. Commercial banks may issue deposit credits, but not currency (banknotes).¹⁴ The legal currency is issued by the central bank on a one-for-one basis with the existing stock of monetary gold (specie). The key virtue of such a system is that, allegedly, neither an excess of money nor an excess of credit could be created.¹⁵ Also, changes in the composition of money demand would not bring about net changes in the money supply. Certainly, it is true that banks could not make loans (issue deposit credits) that exceeded the total of gold they held either in their own vaults or on deposit with the central bank. However, it seems equally clear that both the supply of money and the supply of credit would periodically be *deficient*. Imagine that money demand increases because of population growth (with no change in per-capita productivity). Unless the supply of specie reserves increased proportionately, there would be excess money demand, and notional demand would exceed effective demand. The inside money supply would be far too “inelastic” to respond properly to such an event. Here, again, one sees the false dichotomy of rules versus discretion. In order to curb excessive monetary growth, it is not necessary to make the money supply unresponsive to all changes in economic conditions.

Two further problems should be mentioned. First, with 100 percent reserves, banks cannot make loans from their deposits. Every dollar deposited must be held, ready to be redeemed, at all times. This severely restricts the available credit in the society. One could make a very plausible argument that much of the real economic growth that has occurred would have been impossible in a world of 100 percent reserve banking. Furthermore, banks resent such an imposition. Reserves are not interest-bearing assets¹⁶; to require banks to hold such reserves is, in essence, to place a tax on banking, and the higher the reserve percentage, the greater the tax burden.

Second, a gold standard with 100 percent reserves is an inefficient use of resources. As many economists have argued, for example, Friedman (1959, 4–

6), such a system would require that a significant fraction (perhaps 2.5 percent) of GNP be devoted to the production of money. This is a telling point, although some advocates of gold have tried to rebut it by arguing that the benefits of stability outweigh the losses in terms of resources. This latter is an argument not without merit. However, strictly speaking, such a defense of gold only applies to free banking with fractional gold reserves.

As another variant of the gold standard, one must also consider the possibility of a free-banking regime with 100 percent reserves. This seems unlikely to occur, since none of the historical examples of free banking were based on 100 percent reserves. Nevertheless, the proposal needs to be addressed, and it will be addressed (along with other versions of free banking) in Chapter 7. Suffice it to say at present that free banking with 100 percent reserves seems not to be justified on either economic or ethical grounds. As for free banking with fractional gold reserves, nothing more need be said at this time. It has been examined and defended throughout Chapters 2 and 3.

This leaves only a gold coin standard with fractional reserves and a central monetary authority. The so-called “heyday of the classical gold standard” (1879–1914) is the best example of such monetary regimes in operation. Within the constraints of gold, the Bank of England directed monetary actions in the United Kingdom and the Treasury functioned as a quasi-central bank for the United States (Timberlake 1978). As Michael Bordo has stated in an excellent statistical review of that time, “one dominant feature of the classical gold standard was long-run price stability” (1984, 222). In theoretical terms, the expected long-run rate of inflation was approximately equal to zero. This fostered stable long-run contractual arrangements, greater saving and investment, and strong long-run economic growth. However, at least when compared with the heavily managed post–World War II period, the classical gold standard exhibited greater *short-run* instability of real output, employment, and prices (Bordo 1984, 225).¹⁷ One might say that the classical gold standard worked quite well, but it was not perfect.

There are two serious shortcomings of a centrally managed gold standard. First, to work efficiently, such a system requires that a (temporarily) inflationary country must lose specie because of the concomitant trade deficit. A (temporarily) deflationary country must gain specie because of its trade surplus. This makes for a system that is (1) integrated internationally and (2) self-correcting. However, central banks may thwart this process by indulging in “sterilization.” That is, central banks are able in the short run to offset the effects of international gold flows on their domestic money stocks. This they undertake in an attempt to insulate the domestic economy from actions abroad. Sterilization reduces the equilibrating virtues of a gold standard.

Second, from a purely domestic standpoint, central banks—even on a gold coin standard—may not respond appropriately to a change in the demand for money. If the fraction of income consumers wish to hold as money (the Cambridge k) changes, then the money supply should change in the same direction.

This occurs under free banking because free banks have clear market signals to guide their actions. The signals conveyed by the processes of reflux and adverse clearings lead free banks to monetary equilibrium.¹⁸ Assuming that central banks are nonprofit, “public-interest” agencies, consumer demands for redemption (reflux) may not constrain central bank actions. This is obviously true when central banks decide to suspend payments (refuse to honor redemption demands), and suspension was not unknown among central banks on a gold standard. Furthermore, central banks experience no adverse clearings.¹⁹ That is, they do not have to settle accounts with other banks vis-à-vis either notes or checks (at least not domestically). As a result, short-run monetary imbalances become likely.

Monetary Equilibrium

It has been shown above that the first four frameworks for monetary policy—discretionary countercyclical actions, a stable price level, a constant money growth rule, and a centrally managed gold standard—all suffer from theoretical and/or practical flaws. The optimal monetary policy is one that seeks always to maintain monetary equilibrium (subject to a productivity norm), in both the short run and the long run. Many distinguished economists have endorsed this productivity norm approach to monetary equilibrium: Alfred Marshall, Francis Edgeworth, Ralph Hawtrey, Arthur Pigou, Dennis Robertson, Erik Lindahl, Gunnar Myrdal, Ludwig von Mises, F. A. Hayek, Gottfried Haberler, Fritz Machlup, and Frank Taussig, for example (Selgin 1990, 270–71). Furthermore, monetary equilibrium is the only one of the alternatives that meets all three of the criteria for successful policy suggested by Friedman: (1) to prevent money itself from being the cause of economic disturbances, (2) to provide a stable economic environment, and (3) to offset major disturbances that arise from nonmonetary sources (1968, 12–14). Free banking with fractional gold reserves provides just that.

As explained in earlier chapters, free banking maintains the money supply equal to money demand, the market rate of interest equal to the natural rate, and effective demand equal to notional demand. Under free banking, nominal national income remains constant. Hoarding of cash balances does not lead to deflation and depression, changes in productivity are accommodated so that producers’ revenues stay in line with producers’ costs, and changes in the composition of money demand do not cause changes in the money supply. The goal of monetary equilibrium is intrinsically a countercyclical policy, but one that is motivated purely by the self-interest of each market actor. It is the expression of an Hayekian “spontaneous order.” Moreover, free banking reveals that the clash over “rules versus discretion” is not ultimately germane to the issue. *Neither rules nor* discretion is superior. Free banking is superior to a central bank that adopts either approach.

One may find it illuminating to realize that the other policy goals that have

been reviewed are all *surrogates for monetary equilibrium*. It has just been pointed out that to maintain monetary equilibrium is to take countercyclical action. Regarding a stable, and therefore predictable, price level, James Buchanan acknowledges that “such predictability implies, of course, continuous monetary equilibrium. And if this were accomplished, the actual course of change in the absolute price level would become largely irrelevant” (1962, 161). The CMGR of Friedman is clearly aimed at the achievement of approximate monetary equilibrium in the long run, though not in the short run. Furthermore, the classical gold standard was, of course, a system in which monetary disequilibria were corrected via supposedly automatic changes in international gold flows.²⁰ To put it briefly, one may say that as long as there is continuous monetary equilibrium, all other monetary goals are superfluous.

Despite all the foregoing, the productivity norm is not without its critics. One in particular should be given serious consideration: Kevin Dowd. Not only are his arguments articulate and forceful, but he also is himself a well-known advocate of free banking. Dowd does not condemn laissez-faire approaches to banking, but he does question the alleged superiority of the productivity norm (1991e). He identifies three arguments that have been used to support the contention that the productivity norm is superior to a stable price level: equity, price-adjustment costs, and stabilization.²¹

The equity argument proposes that the results of unexpected changes in productivity should be shared by both debtors and creditors. This would be true of a productivity norm. Under a stable price level rule, both gains and losses would accrue only to entrepreneurs (debtors). Dowd grants that at one level the whole equity issue is something of a red herring. “To avoid getting bogged down in interminable arguments over the ‘just’ division of the gain or loss *ex post*, all one needs to do is take the analysis one step back and allow agents to trade claims to the (as yet) uncertain outcomes” (1991e, 16). That is, let agents contract in accordance with their preferences regarding risk. All that is necessary is to enforce all valid contracts. Dowd adds the penetrating observation that “*we cannot take contract form as fixed, and then compare how that fixed contract performs across the two price-level regimes. The choice of contract depends on the regime itself*” (emphasis in original) (1991e, 17). This suggests a fundamental question: If the likely form of free banking is that based on fractional specie reserves and that version of free banking naturally follows the productivity norm, then is not Dowd’s point moot? The choice may be either free banking and the productivity norm, or central banking and (among other possibilities) a stable price level. Free banking under a price-level rule may not be on the menu.

Dowd pursues his point about price-regime preferences. He offers two reasons why a productivity norm would not be chosen (1991e, 17–18). First, he emphasizes the costs of dealing with a less predictable price level. That such costs exist cannot be in doubt. One must ask, however, whether it is more costly to deal with unpredictable commodity prices or with unpredictable wage

rates. The productivity norm takes nominal wage rates as given; the price level rule takes commodity prices as given (Dowd 1991e, 24). Given the choice, is it not plausible that most individuals would prefer stable nominal wages to a stable price level?²²

Second, he argues that a productivity norm would discourage innovation and productivity improvements on the grounds that gains would not fall entirely on the entrepreneurs (debtors), whose actions often affect productivity. However, workers also affect productivity.²³ In addition, they, as the ultimate creditors, would be denied a share of the gains from productivity improvements under a stable price-level rule. As a result, the flow of funds so essential for financing research into more productive processes might decline. Both debtors and creditors may need to benefit from innovation. It would seem that neither regime is obviously preferable insofar as the encouragement of productivity improvements is concerned.

The second argument for the productivity norm is that it entails lower price-adjustment costs. Dowd declares that this is true—but *only if* both the costs of price adjustment are fixed costs and productivity shocks are discrete events that do not occur continuously (1991e, 20–21). He suggests that both of these conditions are questionable and, therefore, concludes that a price-level rule is superior.

Dowd argues that if one considers factors, such as the timing of purchases, inventory decisions, and the risk involved with a greater price variance, it will become plausible that price-adjustment costs are largely variable costs. This is a good point, but several counterpoints must be made so as to present the complete picture. First, as discussed earlier, a price index that is fully consistent with monetary equilibrium is probably *impossible* to construct. Second, a change in that “ideal” price index does not necessarily impose an additional net cost on all market participants. For certain individuals, the relevant specific price(s) may not change despite the change in the aggregate price level. Price-level variance is not synonymous with (specific) price variance.²⁴ On the other hand, any monetary regime that disrupted the structure of relative prices in order to maintain the price level would bring about monetary disequilibria. If one perceives business cycles as rooted in microeconomic discoordination, then it is the price-level rule that may become suspect. Finally, price changes in response to a productivity shock may be thought of by economic agents as neither wholly unpredictable nor costly. As Dowd himself argues, gains in productivity are often the conscious goal of entrepreneurs (1991e, 18). Imagine a firm that strives to increase productivity so that it may lower its production costs, lower its product price, and gain market share at the expense of its rivals. It would be odd to argue that such a firm experiences an increase in costs. Any price-adjustment costs are clearly overwhelmed by the lower production costs. Price-adjustment costs should not be taken out of the context in which they arise.

As for the frequency of productivity shocks, Dowd seems to allow that this

depends largely on personal interpretation (1991e, 20fn). He sees such events as occurring more or less all the time, whereas Selgin speaks as if they occur only occasionally. The difference may lie in the contrast between product-specific shocks, which appear very frequently, and pervasive shocks, which affect a number of goods and appear much less frequently.²⁵ It would seem clear that the latter pose the greater danger to market coordination if they elicit an inappropriate monetary response. In the context of infrequent, pervasive productivity shocks, the productivity norm is superior to the price-level rule.

The third argument for preferring the productivity norm to a stable price level is the claim that it is more likely to achieve macroeconomic stability (minimize cyclical fluctuations). This Dowd disputes as well. Yet he grants that the core distinction is that "prices were given under the stable price regime, and nominal wages were given under the productivity norm" (1991e, 24). Which would consumers prefer, a stable price level and flexible nominal wages, or a flexible price level and stable nominal wages? This is, presumably, a testable proposition. However, there seems already to be considerable evidence that the latter would be their choice. For example, many consumers (as workers) willingly contract for nominal wages that are fixed for periods of a year or more.²⁶

Dowd raises fundamental questions about the productivity norm vis-à-vis a stable price level. His arguments are lucid and insightful; they bring to the fore certain subtle aspects of the productivity norm position. Nevertheless, in the end, his critique is not quite persuasive. The productivity norm remains the preferable approach to monetary policy.

THE INCENTIVES OF MONETARY AUTHORITIES

Assuming the maintenance of monetary equilibrium subject to a productivity norm is the theoretically optimal goal of monetary policy, it is nonetheless the case that two critical questions remain unanswered. First, are monetary authorities likely to eschew other possible goals in deference to that optimal end? Second, even if monetary authorities sincerely wish to achieve continuous monetary equilibrium, do they possess the requisite knowledge? The first, a problem of incentive structures, will be discussed here. The second, a problem of economic epistemology, will be dealt with in the next section.

James Buchanan suggests that three basic models of a central monetary authority are possible: (1) a monolithic authority that is subject to neither constitutional nor electoral constraints, (2) a monolithic agent subject to direct electoral pressure, and (3) a monolithic agent free from direct electoral pressure but bound by certain general constitutional rules (1986).

The first, which Buchanan calls a "benevolent despot," has no incentive to follow any policy that is not utility-maximizing in his own terms. Thus, a policy of revenue-maximizing inflation will be the nearly certain result. "In this model, it is evident, quite apart from any historical record, that the despot

will find it advantageous to resort to money creation over and beyond any amount that might characterize the ‘ideal’ behavior” (Buchanan 1986, 141). To increase “social welfare” will not be the object of monetary actions in such a regime.²⁷ The second possibility, where voters may exert direct pressure on the monetary authority, suffers from the well-known problem of having to satisfy the median voter (assuming a simple majoritarian decision mechanism). That voter tends to be “myopic” regarding inflation. That is, he has an incentive to place great weight on the short-term gains in terms of employment that he may experience and to have little concern for the long-term harm done to the economy as a whole (Buchanan 1986, 143). The predictable result is an economic environment that is unstable and inflationary.

Electoral impatience, of course, is incompatible with meaningful economic reform, and in particular with a consistent anti-inflation policy. Political leaders who seek to apply policy in a consistent manner invariably lose out to “reflationists” and price controllers. Thus, anti-inflationary efforts are undermined at every turn over the long haul . . . once employment and productivity figures begin to appear. (Smith 1988, 157)

The third case may be thought of as approximating the structure of the Federal Reserve System. The members of the Board of Governors are not permitted to use their monetary powers to increase their personal wealth, and they are generally expected to follow “socially desirable” macroeconomic policies. Otherwise, they appear to possess a high degree of independence (as is often argued). This arrangement, Buchanan claims, reduces the sense of responsibility experienced by such monetary decision makers, because they neither enjoy the full benefits nor suffer the full costs of specific policies (1986, 145). This, in turn, leads to decisions that are less well considered, based on less information, and more sensitive to transient whims and fads than they would be under a more appropriate incentive structure. “Viewed in this perspective, and in application to the Federal Reserve agency in the United States, and perhaps notably after the removal of international monetary restraints, there should have been no surprise that the behavior exhibited has been highly erratic” (Buchanan 1986, 146).

Buchanan concludes that monetary disequilibrium is the likely result under a central authority modeled in any of the aforementioned three patterns. He thinks the only solution might be to index the salaries of those employed by the central bank, so that any departure from a stable price level would impose personal losses on those responsible (1986, 148). This proposal is flawed, however, in that it assumes that continuous monetary equilibrium is synonymous with a perfectly stable price level. Under most circumstances, they are the same, but in the face of productivity shocks, they clearly differ.

Richard Wagner (1986) offers a variation on Buchanan’s theme. He argues that the Fed is best understood as an exercise in congressional rent-seeking. In his view the Federal Reserve is a creature of Congress—specifically, an agent

of the House and Senate banking committees—and exists for the express purpose of achieving certain distributional effects by means of counterfeiting (monetary expansion). “The Fed would seem to be principally involved in the supply of counterfeiting, and to do so by virtue of a license from Congress” (Wagner 1986, 531).

Whatever particular interpretation of central bank behavior one employs, one thing seems clear in the light of public-choice theory:²⁸ No monetary authority is likely to adopt any policy that might be termed “socially optimal.” Realistically, that is, monetary equilibrium will never be the preferred goal of central banks.

THE KNOWLEDGE PROBLEM

The ultimate challenge to the possibility of rational monetary policy being undertaken by a central bank is neither procedural nor political, but epistemological in nature. Even if one grants that the monetary authority has both accepted the premise that monetary equilibrium is the theoretically optimal policy goal and adopted that goal as the guiding principle for its actions, it still does not follow that said authority will be able to achieve its objective. Indeed, it will here be argued that no central authority can ever possess sufficient economic knowledge to reach such an objective.

It is essential to understand that the problem facing monetary authorities is *not* simply one of insufficient data or inadequate data processing. It is far more fundamental. The problem springs from two interrelated sources: (1) confusion regarding the nature of economic knowledge and (2) a failure to perceive the market as a process of discovery.

That economic knowledge is not a monolithic whole susceptible to manipulation by some bureaucratic entity has been well expressed by Hayek:

[T]he concrete knowledge which guides the action of any group of people never exists as a consistent and coherent body. It only exists in the dispersed, incomplete, and inconsistent form in which it appears in many individual minds, and the dispersion and imperfection of all knowledge are two of the basic facts from which the social sciences have to start. (1979b, 49–50)

Not only is knowledge widely dispersed, but it is also resistant to aggregation. Objective data, such as changes in specific prices, are not the basis for human action. Humans act upon their *interpretations* of those data, and each interpretation may be different. “A rise in the price of a given commodity, for example, will have different meanings depending on the ‘elasticity of expectations’ of the receiver. A price rise may signal higher or lower future prices when the subjective context of the data is taken into account” (O’Driscoll and Rizzo 1985, 41).

Furthermore, knowledge may be inarticulate in form. That is, underlying

much that can be articulated, one finds the implicit or “tacit” definitions and rules of presentation without which explicit statements cannot be made (Lavoie 1985, 59–63), and some knowledge seems difficult to articulate at all—how to ride a bicycle, for instance.²⁹ If any significant portion of knowledge is implicit, subjective, and (perhaps) meaningless when aggregated, however, then how can any centralized agency ever collect—much less understand and use—such knowledge? Data are available in abundance, but since “knowledge is not the same as data” (Lavoie 1985, 57), the collection of mere data does not necessarily constitute an increase in one’s store of knowledge.

Inextricably interwoven with the above conception of economic knowledge is the understanding of the market as a discovery process. Such an understanding may ensue from the following line of reasoning. Humans, being finite and fallible, act in order that they may remove or reduce some dissatisfaction in their lives. In contrast to humans, “a perfect being would not act” (Mises 1976, 24).³⁰ To achieve this reduction of dissatisfaction, individuals engage in a great variety of market transactions with a multitude of other individuals. The intent is, generally, to benefit (to profit) from those interactions. The most common—though not the only—guides for such actions are prices.

However, “prices are useful guides or signals because, and insofar as, they reveal discrepancies, previous maladjustments, and errors. . . . Prices reveal what people want relatively more urgently now, and in the future, not what they would want in a hypothetical and unattainable equilibrium” (O’Driscoll and Rizzo 1985, 106). Furthermore, the knowledge of prices is “of temporary and fleeting significance” and tends to be profitable precisely to the extent that and only so long as “others do not also know it” (O’Driscoll and Rizzo 1985, 103). That is to say, useful economic knowledge is essentially a *private* knowledge of *disequilibrium* conditions. Knowledge is never a “given” for any economic agent except in the Walrasian world of eternal general equilibrium, and in that context, such “knowledge” is not really economic in nature, but merely engineering knowledge about physical production relations. In the real world, individuals must discover the relevant facts by means of trial and error, which means that the generation of knowledge is only truly effective in the absence of artificial distortions and constraints, that is, under competitive conditions. It would seem obvious that every intervention by a monetary authority distorts not only current conditions, but also individuals’ expectations of future conditions, and the more extensive the intervention, the more one finds that resources are diverted to learning about the interventionists rather than about market participants. Finally, the relevance of any particular bit of information cannot be established independently of the values, goals, and expectations of the actor. Economic knowledge is, to some irreducible extent, idiosyncratic (Butos 1986, 851).

If true economic knowledge is widely dispersed, at least partly tacit in nature, discovered by trial and error in a free market context, and both goal- and agent-specific, then central monetary authorities are confronted by an insur-

mountable obstacle. They attempt to aggregate data that cannot, when aggregated, represent meaningful economic knowledge, and, on the basis of that data, they undertake macroeconomic actions designed to achieve goals that (even when desirable) can only be attained at a microeconomic level.

To put it bluntly, one must conclude that the optimal goal of monetary equilibrium is likely within a free-banking structure but probably impossible for a central bank.³¹ Free banks have the advantage of market signals that are both more reliable and more rapid than any mechanism available to a central bank. For example, consider the processes of “reflux” and “adverse clearings.” One may recall that whenever an individual free bank expands its outstanding liabilities (either notes or deposit credits) beyond the desired cash balances of its customers, the excess will be returned for redemption. This depletes the bank’s reserves and, for any given reserve ratio deemed optimal by the bank’s officers, forces a contraction in the supply of the distinctive money issued by that bank. Furthermore, if the income velocity of money changes—resulting, perhaps, from consumers’ changing expectations regarding future commodity prices—free banks’ optimal reserve ratios will change in the same direction, which means that the money supply will change in the opposite direction. Market forces at the local level push the banking system toward monetary equilibrium.

To compare the decentralized adjustment mechanisms of free banking to the tools of central bank policy is something akin to placing a scalpel rather than a blunt instrument in the hands of a surgeon. The typical central bank tools—changes in legal minimum reserve ratios, changes in the discount rate, and open market purchases or sales of government securities—are creatures of aggregation. As such, they attempt to correct at the national level what may only be an imbalance at the local level.

For example, assume that the income velocity of money falls for the society as a whole, because it falls in one geographical area but remains constant elsewhere.³² The central bank, if it detects the change at all, will increase its open market purchases (or, alternatively, lower either the legal reserve ratio or the discount rate) and thus increase the overall money supply.³³ This may or may not reestablish monetary equilibrium in the area where velocity fell, but it *will* introduce an excess supply of money into the rest of the nation, which condition must be corrected by further macromanipulations, and so forth. To reiterate, monetary disequilibrium is a problem that has profound macroeconomic effects but that must be solved at the microeconomic level.

SUMMARY

For decades it seems to have been a tenet of faith among most economists that a central monetary authority is essential to a stable and efficient economic system. They perceived such authorities as benevolent, public-spirited benefactors whose prowess was limited only by data processing considerations. This chapter has presented a radically different position. First of all, several plausi-

ble frameworks for monetary policy were reviewed. Only monetary equilibrium subject to a productivity norm was seen to be defensible as a rational goal. The alternatives that were considered—discretionary countercyclical actions, a stable price level, a constant money growth rule, and a centrally managed gold coin standard—were not without some merit. However, all were seen to be “second-best” solutions. This is largely due to the fact that those alternatives are macroapproaches to what is fundamentally a microproblem.

Second, it was demonstrated that monetary authorities are very unlikely ever to aim for any policy goal that might be construed as “socially optimal.” Public-choice theory seems to present an irrefutable argument that central banks are either rent-seekers or the agents of those who seek political rents. To aim for monetary equilibrium at all times would be to forgo such rents.

Finally, it was argued that, even if a central bank both identified continuous monetary equilibrium as the rational policy goal and was willing to seek that goal, it could not possess the knowledge necessary for such a task. The more common, contrary assumption is based on two errors: (1) a misunderstanding of the nature of economic knowledge and (2) a misunderstanding of the market process. Continuous monetary equilibrium becomes feasible only in a decentralized, competitive environment in which profit and loss signals nurture a “spontaneous order.” Free banking is the “first-best” solution to monetary problems.

NOTES

1. Mises' critique of central planning first appeared in 1922 in German. It was later (1936) translated into English.
2. In most of the non-Communist nations during the post-World War II period, this collectivism has appeared in the form of what is variously called “the mixed economy,” “democratic socialism,” or “welfare state capitalism.” Its defining characteristics are (1) nominal private property, (2) extensive regulation regarding the use of that “private” property, and (3) a tripartite coalition of government, business, and labor that seeks to direct the economy. See Hayek (1944) for a discussion of the origins of this approach.
3. See Chapter 3 for a detailed discussion of this.
4. It should be pointed out that Hayek contributed mightily to the development of the Austrian theory. Indeed, it might be—and has been—referred to as the “Mises-Hayek theory of the trade cycle.”
5. This is a severely simplified summary of the new-classical position. The rational expectations/new-classical treatment is both quite sophisticated mathematically and, in some respects, rather elegant. Perhaps the most laudable thing about the new-classicals is their recognition of the fact that a sound macroeconomics must be consistent with microeconomic principles.
6. This may seem like a critique of the free-banking model in Chapters 2 and 3. However, the author would argue that Friedman's comments apply only to central banking—which, of course, is what Friedman had in mind anyway. Under free banking, the quantity of money is strongly related, even in the short run, to the velocity of money,

goods' production costs, bank reserves, the price of specie, and interest rates. The connection between prices and money is thus more robust under free banking than under central banking.

7. Selgin assumes that the changes in nominal revenues are not perfectly anticipated by all economic agents.

8. This would exacerbate the problem the CMGR is intended to attenuate.

9. One must assume that Friedman's overall object is to minimize (over the long run) either the net departures from the natural rate of unemployment or the net departures of GNP from its trend. Of course, these may amount to the same thing.

10. See Chapters 2 and 3.

11. It is only fair to point out that this may not be an entirely accurate picture of the "monetarist" position. Thomas Humphrey (1984, 17) argues that several renowned monetarists have, indeed, acknowledged the nonneutrality of money. For example, Irving Fisher "recognized how interest rate changes can alter the time structure of production and thus the composition (mix) of output." In addition, Clark Warburton saw that "due to the lag of wages and other costs behind prices and the resulting impact on profits, monetary changes have real effects."

12. See Chapter 2.

13. This is the "only solution" only if one takes the central bank for granted.

14. The alternative—free banking with 100 percent reserves—is discussed next.

15. Tangential to this are the claims that commercial banks would be less prone to failure and the central bank could exercise tight control over the money supply.

16. They do not bear *explicit* interest. During deflation, reserves do bear implicit interest in the form of a greater purchasing power per dollar. Also, it is conceptually possible for central banks to pay interest on the reserves they hold on behalf of commercial banks. Nevertheless, this is rarely done by central banks.

17. Some of this "instability" may be spurious. See Christina Romer (1986a; 1986b).

18. See Chapters 2 and 3.

19. This assumes a legal tender currency, issued exclusively by the central bank.

20. It was the sterilization by central banks that often prevented or delayed such corrective movements.

21. Dowd's comments are sympathetic criticisms of certain aspects of Selgin's work on free banking. By implication, therefore, they are also criticisms of the present work.

22. This would seem particularly true if workers could, by their own efforts, increase per-capita productivity and reap the gains of lower commodity prices (higher real wages) under a productivity norm.

23. One may think here of worker investments in "human capital," for example.

24. Perhaps to think of the price level as a portfolio of specific prices would be helpful. The variance of the price level depends on both the variances and covariances of the individual prices.

25. Pervasive shocks would also be less predictable than product-specific shocks. The degree of predictability is also of concern to Dowd.

26. One might respond to this by suggesting that nominal wage contracts involve lower transaction costs than do, say, commodity futures contracts. That is, futures markets are not generally accessible to consumers. Might the lower costs, however, not be the *result* (rather than the cause) of more widespread use, that is, the result of consumer preference?

27. This is not to suggest that "social welfare" is a meaningful concept as it is

usually employed, only that the central authority will act in response to one's own preferences rather than those of the citizenry.

28. For the seminal work in public-choice economics, see Buchanan and Tullock (1962).

29. Note in this vein how it is common to encounter financial analysts who say they simply "feel" stock prices will rise (or fall) but who may not be able to identify exactly why they "feel" this will occur.

30. This may be the only interface between modern economics and theology, but it is an intriguing one.

31. If monetary equilibrium were achieved in a central banking regime, it would be by accident. The argument here is that it is impossible for a central bank consistently to either (1) attain such equilibrium or (2) know that it has been attained. The requisite knowledge is simply not available to such an agency.

32. Monetary economists usually do not pay much attention to this, but it is nevertheless true that the velocity of money does vary from region to region and industry to industry. See Richard Selden (1962).

33. One may question whether the central bank will react in a timely fashion even if it does detect the change, and any significant time lag might exacerbate the imbalance.

Chapter 5

SCOTTISH FREE BANKING

The three previous chapters have presented a number of theoretical arguments for free banking. One must turn now to the historical side of this issue. This chapter is devoted to a look at Scottish free banking. Chapter 6 will examine the American experiment with multiple issuers of notes. These are probably the best-known and best-documented cases of free banking. However, the reader should be aware of a problem that persists with any review of these periods. There is much anecdotal evidence extant, but rather limited hard data—especially in the Scottish case. Therefore, some of the implications of the model presented earlier simply cannot be tested in any direct way, and the empirical conclusions that can be reached must in some instances be rather tentative because of the nature and age of the data. Despite such difficulties, the importance of these episodes makes their investigation imperative.

There was a time when knowledge of free-banking regimes had almost disappeared from economic history. This was, of course, prompted by the theoretical conviction that central banking was natural and necessary, because free banking was believed to be chaotic and inflationary. The recent rebirth of interest in the theory of multiple note issuers¹ has also inspired much historical investigation. Work by, among others, Hugh Rockoff (1975; 1985), Arthur Rolnick and Warren Weber (1982a; 1982b; 1985; 1986), Lars Jonung (1989), Kevin Dowd (1992), and Donald Wells and Leslie Scruggs (1986a) has significantly expanded the understanding of such systems. For example, it is now known that banking with multiple note brands has been much more common than most would think. There appear to have been at least sixty episodes of approximate free banking, that is, cases where banks were allowed to issue their own notes (Dowd 1992, 2).² Perhaps the most influential of all such ex-

aminations of historical free banking has been the work of Lawrence H. White on Scottish banking (1984a, 1984b, 1989a, 1991).

Friedrich Hayek had earlier presented a theoretical case for thinking that free banking *would* work. White's *Free Banking in Britain* appeared in 1984 and argued that free banking *had already worked* in Scotland during an earlier period. A convincing "test case" for free banking seems to have been overlooked for generations.³ White's conclusions have elicited intense interest, and deserve to be examined seriously and carefully.

WHITE'S INTERPRETATION

Free banks began to appear after the charter of the monopolistic Bank of Scotland expired in 1716. The first was the Royal Bank of Scotland in 1727. The competition that arose between the two rivals quickly brought benefits to the public in the form of "the cash credit account, a form of overdraft account" (White 1984a, 26). This expanded the bank's note circulation at the same time that it "allowed an individual to borrow against his human capital at lower transactions costs and so enable him to undertake productive projects that otherwise would have been unprofitable" (White 1984a, 27). During the 1740s and 1750s, a number of small banking concerns appeared, but the most important entrant of the time was the British Linen Company (later the British Linen Bank) in 1746.⁴

There was nearly complete freedom of entry into banking during this era. After 1765, the only legal restrictions were (1) shareholders faced unlimited liability regarding creditors' claims on the bank,⁵ (2) banks could not print notes of denominations smaller than one pound-sterling, and (3) option clauses were illegal. Despite these constraints, banking in Scotland prospered, and the economy grew. By 1844, there were "19 banks of issue in Scotland with 363 branches, providing one bank office for every 6,600 persons in Scotland, as compared with one for 9,405 in England and one for 16,000 in the United States" (White 1984a, 34). Even though there existed some economies of scale, there seemed to be no tendency for the system to collapse into a single entity. Moreover, economic growth seemed robust. Citing Rondo Cameron, White declares that "Scotland's per capita income was no more than half that of England's in 1750 but nearly equal it by 1845" (1984a, 24).

An important feature of the Scottish system was the weekly note-exchange. This developed spontaneously in the late 1760s. Banks realized that in order to maximize the market for their own notes, they would need to accept their rivals' notes at face value. That is, if consumer X is presently holding notes issued by bank A, he is unlikely to open an account with bank B unless B is willing to credit him with the face value of the banknotes he possesses. This note-exchange process involved the weekly clearing of interbank holdings of one another's notes. It served not only to increase the marketability of bank-

notes relative to specie, but also to check any attempt at overissue on the part of an individual bank (White 1984a, 20–22).

According to White, the virtues of the Scottish system were undeniable. Counterfeiting was “not a significant problem in the Scottish experience” (White 1984a, 40), for example. This he attributes to the care the free banks took in designing elaborate and distinctive notes and the rapidity with which—because of the note-exchange process—notes were returned to their issuer. By way of contrast, counterfeiting of Bank of England notes was a chronic problem in England, especially during the 1797–1821 suspension of specie payments. Noteholder losses in Scotland were also relatively small. The total loss to the public brought about by bank failures amounted to 32,000 pounds-sterling for the period 1695 to 1841, whereas the losses in England for the year 1840 alone were twice as great (White 1984a, 41). This was an innovative system as well. The British Linen Bank of Edinburgh established the first branch bank in the early 1760s. The Union Bank of Glasgow made the first public disclosure of a bank’s annual balance sheet in 1836.

Bank failure was not common according to White. The only major bank failure during the entire period was that of the Ayr Bank in 1772. It tried to do what could not be done in this system. It attempted to expand the circulation of its notes beyond the demand. Indeed, the Ayr Bank overextended itself to the tune of about 667,000 pounds-sterling. Nevertheless, this failure did not result in a general bank panic. In fact, the Edinburgh banks experienced a perceptible increase in specie demand for only one day. The reason was that, because of the rapid note-exchange mechanism, no other major banks were caught holding large amounts of the Ayr Bank’s notes. Furthermore, because of the unlimited liability provision, all the bank’s creditors were paid in full by the bank’s 241 shareholders (White 1984a, 31–32).

On top of everything else, the “Scottish free banking system proved far hardier during periods of commercial distress than did its English counterpart” (White 1984a, 44). Throughout the long Napoleonic Wars, for example, the Scottish economy allegedly experienced milder cyclical fluctuations than did that of England. This White attributes in part to its superior banking system. The empirical support for White’s conclusions consists of data on comparative failure rates for Scottish versus English banks over the period 1809–1830. This reveals that on average Scottish banks failed at the rate of 4.0 per thousand, whereas English failures were 18.1 per thousand (White 1984a, 48).

White admits the danger of basing broad conclusions on a single historical example. Nevertheless, he believes Scottish free banking to be illustrative of certain basic principles.

[B]ecause we lack knowledge of any other truly free banking systems of significance, the Scottish experience, interpreted in the light of our theoretical constructions, must largely inform our understanding of what we should generally expect from free banking.

Though perhaps not conclusive, Scotland's experience is certainly consistent with the hypothesis that monetary freedom is workable and self-regulating. (White 1984a, 137)

Finally, White notes that free banking ended not because of dissatisfaction on the part of either the consumers or the bankers in Scotland. Both seemed quite pleased with—even protective of—the system. The demise of Scottish free banking was imposed from above for political reasons. The English Parliament passed the Bank Charter Act in 1844 and the Scottish Bank Act in 1845. These effectively ended freedom of entry and the competitive issuance of notes, and put the Scottish banks under the aegis of the Bank of England.

A CRITIQUE OF WHITE

The increasing attention devoted to free banking in the last few years has certainly been both invigorating and long overdue. Moreover, much of the credit for this reanimated interest must be given to White for his research into Scottish banking. However, despite its stimulating content, White's work is not without some questionable elements. The present section will enumerate some of the reasons for such skepticism.⁶ In general, it is not that White's facts are false. The doubts that arise stem principally from the belief that White has either misinterpreted the facts or failed to include certain countervailing facts.

One should understand, first of all, that this controversy is not merely some trivial dispute over an arcane bit of history with no relevance for the present day. In many writers' minds, the theoretical case for free banking has been intimately tied to the alleged success in Scotland. White himself contends that free banking in Scotland "provides unique evidence on the workability of monetary freedom" and "may also help us answer other questions concerning the stability or efficiency of an unregulated monetary system" (1984a, 137, 141).

Furthermore, White's interpretation of Scottish banking has gained a wide circulation. Among those who have cited White favorably, one finds Milton Friedman and Anna Schwartz (1986, 49–51), George Selgin (1988a, 7, 81, 140; 1989, 450), Catherine England (1988, 795–96), Karen Palasek (1989, 400), Gerald O'Driscoll and Mario Rizzo (1985, 10, 225), Murray Rothbard (1983, 185), Gerald O'Driscoll (1986, 601–2), David Glasner (1989, 37), Dowd (1989, 153–57; 1992, 1), and Roger Miller and Robert Pulsinelli (1989, 211–12). As for objections, until recently, there had been few. Jack Carr and Frank Mathewson (1988), Larry Sechrest (1988; 1990; 1991), Rothbard (1988b), and Tyler Cowen and Randall Kroszner (1989) have posed challenges to White's historical work, whereas Charles Munn (1985) and Charles Goodhart (1987) have offered short critical reviews.

The issues to be raised here are (1) bank failure rates, (2) economic growth, (3) note convertibility, (4) restrictions on small-denomination notes, (5) the Usury Law as a constraint on competition, and (6) the privileges of the chartered banks. The contention is that, although Scotland did allow a multiplicity

of note issues, it nevertheless was not the close approximation to "pure" free banking that White seems to think it was.⁷

Much of the evidence presented in what follows will be drawn from the survey of Scottish banking written by S. G. Checkland (1975). This work White has called "S. G. Checkland's authoritative chronicle of the industry" (1984a, 33). Moreover, White himself has declared that Checkland "is, of course, the authority on the facts" (letter to Peter Lewin and the author, April 30, 1986).

Bank Failures and Stability

Certainly one of the key dimensions along which one would want to measure the success of any banking system is the rate of firm failure.⁸ White obviously agrees for he bases most of his case for Scottish stability on the allegedly lower rate of failure experienced by Scottish banks relative to English banks (1984a, 48). Not surprisingly, he concludes from this that Scottish banks were substantially less failure-prone and calls the Scottish system one of "remarkable monetary stability" (1984a, 23).

First of all, White seems slightly to miscalculate the averages. From his own table, the figures work out to be 4.46 and 17.54, respectively, rather than 4.0 and 18.1. More importantly, White's figures cover only a small portion of the period in question. He himself has stated that "the act of 1765 left Scotland with free banking" (1984a, 30). A longer time series would seem desirable, especially in light of the Ayr Bank failure of 1772. That episode White describes as minor insofar as the system as a whole was concerned (1984a, 32). Checkland agrees that little permanent damage was done (1975, 133–34), but does point out that "no less than thirteen Edinburgh private bankers fell with the Ayr Bank, never to rise again" (1975, 132). There were also several Scottish failures between 1773 and 1808. If one includes these data, one finds that for the period 1772–1830, the average annual failure rates per thousand for England and Scotland are 14.90 and 14.88, respectively (see Table 1). The rate for Scotland is thus *not statistically different* from that for England at the 99 percent confidence level.

White has recently attempted to rebut this point. He suggests carrying the series back to 1716 and thereby achieving a failure rate for Scotland of 7.98 (White 1991, 811–12). This, however, is inconsistent with his own declaration that the free-banking era started in 1765 (1984a, 30). Indeed, since White puts such great emphasis on the note-exchange process as a foundation of the Scottish success, one would think that he might identify the beginning of free banking with the development of that process, that is, about 1770.⁹ White also suggests that one should be more concerned with economic significance than with statistical significance and that raw failure rates per se are not necessarily very important (1991, 813). Both points are well taken. However, how does one determine what an "economically significant" rate of bank failure may be? For example, the average annual rate per thousand for U.S. banks between

Table 1
Bank Failures per Thousand, 1772–1830

| Year | England | Scotland | Year | England | Scotland |
|------|---------|----------|------|---------|----------|
| 1772 | ...* | 451.6 | 1802 | 7.6 | 0 |
| 1773 | ...* | 0 | 1803 | 14.6 | 0 |
| 1774 | ...* | 0 | 1804 | 14.5 | 0 |
| 1775 | ...* | 0 | 1805 | 11.4 | 0 |
| 1776 | ...* | 47.6 | 1806 | 4.2 | 0 |
| 1777 | ...* | 0 | 1807 | 5.8 | 0 |
| 1778 | ...* | 0 | 1808 | 5.2 | 54.1 |
| 1779 | ...* | 0 | 1809 | 5.7 | 0 |
| 1780 | ...* | 0 | 1810 | 25.6 | 27.0 |
| 1781 | ...* | 41.7 | 1811 | 5.1 | 0 |
| 1782 | ...* | 0 | 1812 | 20.6 | 0 |
| 1783 | ...* | 0 | 1813 | 8.7 | 14.3 |
| 1784 | 25.2 | 0 | 1814 | 28.7 | 0 |
| 1785 | ...* | 0 | 1815 | 27.3 | 9.0 |
| 1786 | ...* | 0 | 1816 | 44.5 | 14.1 |
| 1787 | ...* | 0 | 1817 | 4.0 | 0 |
| 1788 | ...* | 0 | 1818 | 3.9 | 0 |
| 1789 | ...* | 0 | 1819 | 16.5 | 0 |
| 1790 | ...* | 0 | 1820 | 5.2 | 13.2 |
| 1791 | ...* | 0 | 1821 | 12.8 | 66.7 |
| 1792 | ...* | 0 | 1822 | 11.6 | 13.0 |
| 1793 | 17.9 | 90.9 | 1823 | 11.6 | 0 |
| 1794 | 3.7 | 0 | 1824 | 12.8 | 0 |
| 1795 | ...* | 0 | 1825 | 46.4 | 12.0 |
| 1796 | 6.6 | 0 | 1826 | 53.1 | 11.1 |
| 1797 | 17.4 | 0 | 1827 | 11.9 | 0 |
| 1798 | 12.8 | 0 | 1828 | 4.5 | 0 |
| 1799 | ...* | 0 | 1829 | 4.4 | 11.4 |
| 1800 | 8.1 | 0 | 1830 | 20.9 | 0 |
| 1801 | 10.4 | 0 | | | |

Sources: Lawrence H. White, Free Banking in Britain: Theory, Experience, and Debate, 1800–1845 (New York and London: Cambridge University Press, 1984) 48. Sidney G. Checkland, Scottish Banking: A History, 1695–1973 (Glasgow, Scotland: Collins, 1975) 132, 177–78. Leslie S. Pressnell, Country Banking in the Industrial Revolution (Oxford: Clarendon Press, 1956) 11, 537–38.

Notes: mean (England) = $\bar{X}_1 = 14.90$
mean (Scotland) = $\bar{X}_2 = 14.88$
standard deviation (England) = $\sigma_1 = 12.09$
standard deviation (Scotland) = $\sigma_2 = 60.01$

Table 1—Continued

observations (England) = $n_1 = 37$
 observations (Scotland) = $n_2 = 59$

To test the hypothesis that $\bar{X}_1 = \bar{X}_2$,

$$\sigma_{x1-x2} = \sqrt{\frac{\sigma_1^2}{n_1} + \frac{\sigma_2^2}{n_2}} = 8.061$$

$$Z = \frac{\bar{X}_1 - \bar{X}_2}{\sigma_{x1-x2}} = \frac{14.90 - 14.88}{8.061} = .00248$$

Therefore, one cannot reject the hypothesis at the 99 percent confidence level.

In contrast, using White's figures,

$$\bar{X}_1 = 17.54 \quad \sigma_1 = 14.33, \quad n_1 = 22$$

$$\bar{X}_2 = 4.46 \quad \sigma_2 = 5.98, \quad n_2 = 22$$

$$\sigma_{x1-x2} = \sqrt{\frac{\sigma_1^2}{n_1} + \frac{\sigma_2^2}{n_2}} = 3.31$$

$$Z = \frac{\bar{X}_1 - \bar{X}_2}{\sigma_{x1-x2}} = \frac{17.54 - 4.46}{3.31} = 3.95$$

Thus, one must reject the hypothesis at the 99 percent confidence level.

*No data are available.

June 30, 1921 and June 30, 1929 was 22.23 (Upham and Lamke 1934, 247), higher than either the English or Scottish rates noted above. Furthermore, the 1920s are conventionally perceived as having been both prosperous and stable. Is 22.23 a "significantly" high rate of failure? Finally, if White did not think failure rates so important, why did he make the contrast between the two countries a prominent part of his defense of Scottish free banking?

To pursue the issue of stability, one may note that there occurred a number of financial crises during the free-banking period: in 1772, 1778, 1787, 1793, 1797, 1802–1803, 1809–1810, 1818–1819, 1825–1826, 1836–1837, and 1839 (Checkland 1975, 213–14, 403), nor does one get an impression of much stability if one examines wholesale prices for Great Britain during the 1765–1845 period (see Table 2).¹⁰ Checkland offers a summary judgment of the Scottish system when he says that "[i]n principle, it should have been capable of stability or, at least, of fairly easy contraction. In reality, it was not" (1975, 214).

Table 2**Wholesale Price Index for Great Britain, 1765–1845 (1770 = 100)**

| Year | Index | Year | Index | Year | Index |
|-------------|--------------|-------------|--------------|-------------|--------------|
| 1765 | 106 | 1792 | 123 | 1819 | 178 |
| 1766 | 107 | 1793 | 135 | 1820 | 160 |
| 1767 | 109 | 1794 | 137 | 1821 | 139 |
| 1768 | 108 | 1795 | 160 | 1822 | 123 |
| 1769 | 99 | 1796 | 162 | 1823 | 137 |
| 1770 | 100 | 1797 | 148 | 1824 | 142 |
| 1771 | 107 | 1798 | 150 | 1825 | 157 |
| 1772 | 117 | 1799 | 174 | 1826 | 139 |
| 1773 | 119 | 1800 | 210 | 1827 | 138 |
| 1774 | 116 | 1801 | 217 | 1828 | 134 |
| 1775 | 113 | 1802 | 170 | 1829 | 134 |
| 1776 | 114 | 1803 | 173 | 1830 | 132 |
| 1777 | 108 | 1804 | 173 | 1831 | 132 |
| 1778 | 117 | 1805 | 189 | 1832 | 128 |
| 1779 | 111 | 1806 | 187 | 1833 | 124 |
| 1780 | 110 | 1807 | 183 | 1834 | 121 |
| 1781 | 115 | 1808 | 201 | 1835 | 118 |
| 1782 | 116 | 1809 | 216 | 1836 | 132 |
| 1783 | 129 | 1810 | 213 | 1837 | 131 |
| 1784 | 126 | 1811 | 202 | 1838 | 137 |
| 1785 | 120 | 1812 | 228 | 1839 | 145 |
| 1786 | 119 | 1813 | 235 | 1840 | 143 |
| 1787 | 117 | 1814 | 215 | 1841 | 137 |
| 1788 | 121 | 1815 | 181 | 1842 | 124 |
| 1789 | 117 | 1816 | 166 | 1843 | 111 |
| 1790 | 124 | 1817 | 184 | 1844 | 113 |
| 1791 | 125 | 1818 | 194 | 1845 | 116 |

Source: Brian R. Mitchell, European Historical Statistics: 1750-1970, 2nd ed. (London: Macmillan Press, 1978) 388.

Economic Growth

What of White's claim that "the period of Scottish free banking coincided with a period of impressive industrial development. . . . The growth of Scotland's economy in the century prior to 1844 was more rapid even than England's" (1984a, 24)? This conclusion is based on the statement of economic historian Rondo Cameron to the effect that "it would not be unreasonable to infer . . . that in 1750 per capita income of Scotland was no more than half that of England, but that by 1845 it very nearly equaled England's" (1967, 94). This inference is *not* based on unambiguous data. Cameron himself admits

that "there are no separate statistics of national income for Scotland for this period" (1967, 94). Conclusions of the sort in which Cameron and White indulge must, therefore, be based on indirect evidence. Admittedly, some such evidence does exist.

For example, both Richard Hildreth (1968, 16) and T. S. Ashton (1969, 70–75) suggest that the banking industry in Scotland contributed significantly to that country's expansion. White cites Adam Smith as an additional proponent of this view (1984a, 24). However, this writer can find no such assertions in the *Wealth of Nations*.¹¹ Indeed, the opposite seems more nearly to be Adam Smith's position.¹² Smith states that "Scotland, though advancing to greater wealth, is advancing more slowly than England" (1937, 189). He also makes references to the "imprudence" of Scottish banks (1937, 288) and "that excess of banking, which has of late been complained of both in Scotland and in other places" (1937, 302). It would seem clear that the issues of cyclical stability and economic growth will not be resolved until separate series on Scottish prices, interest rates, and national income are either discovered or generated. Until then, White's conclusions must remain quite tentative.

Banknote Convertibility

White goes so far as to *define* free banking as "the unrestricted competitive issue of specie-convertible money by unprivileged banks" (1984a, ix). More recently, he has reaffirmed that redeemability is an essential characteristic of competitive inside money (1989b, 368fn). Thus, if convertibility was not, in fact, consistently practiced in Scotland, then one may conclude that a significant element of free banking was absent.¹³ Of course, it is well known that before 1765 immediate redemption did not always occur because banks sometimes invoked the "option clause"; that is, they delayed redemption in exchange for the payment of explicit interest to the noteholder. Did strict convertibility hold, however, after 1765? Damaging to White's case is this declaration by Checkland:

The Scottish system was one of continuous partial suspension of payments. No one really expected to be able to enter a Scots bank . . . with a large holding of notes and receive the equivalent immediately in gold or silver. At best they would get a little specie and perhaps bills on London. (1975, 185)

Checkland also suggests that "much emphasis was laid on the loyalty of the banks' customers—requests for specie met with disapproval and almost with charges of disloyalty" (1975, 184). Frank W. Fetter agrees: "To a large degree there was a tradition, almost with the force of law, that banks should not be required to redeem their notes in coin" (1965, 122). To this, Henry Meulen adds the observation that a Scottish bank usually "paid notes instead of gold to any depositor who might call, and thus was able to operate with a smaller

reserve of gold than would otherwise have been necessary" (1934, 136). Additional comments along these lines may be found in both Checkland (1975, 186, 222, 438) and Meulen (1934, 129).

Curiously, White (1989a, 36) claims that statements such as the foregoing have been rebutted by Kevin Dowd (1989). In fact, Dowd agrees that "Scottish notes were imperfectly convertible, even after the passage of the 1765 Act" (1989, 156). What Dowd does dispute is that such inconvertibility represented a significant departure from free banking (1989, 156–57).¹⁴ Yet both White (1984a, 6–19) and Selgin (1988a, 94–96) have argued forcefully that free banks issuing debt-based, that is, specie-convertible, notes and deposit credits are constrained from overissuing such liabilities by the fact that these firms face rising marginal costs. Furthermore, said marginal costs rise largely because of liquidity costs, that is, the costs of acquiring and holding specie for the purpose of redemption. This redemption may occur in the course of either interbank or bank-customer transactions (the processes of adverse clearings and reflux).

In the absence of convertibility, free banks would experience a much-relaxed constraint on overissuance. For example, when discussing free banking in Michigan, Dowd seems to concede this when he states that "the suspension of convertibility removed the main check against over-issue, and so a monetary explosion was to be expected" (1989, 137). It would seem clear that convertibility is essential to any (specie-based) system that merits being characterized as free banking.

Small-Denomination Notes

In 1765, the British Parliament imposed on Scotland legislation that prohibited not only the option clause, but also the issue of notes smaller than one pound-sterling. The option clause has often been discussed—see Dowd (1991h), White (1984a), or Selgin (1988a), for example—but the prohibition of small-denomination notes seems to have received little attention.

Three aspects of this are of importance. First of all, one needs to realize that the one-pound note of 1765 had roughly the purchasing power of \$180–\$200 in the United States today.¹⁵ This figure may be achieved by discovering that British prices are presently ninety to 100 times the level of 1765 (Mitchell 1988, 719–34) and observing recent exchange rates of about \$2.00 per pound. The implication is that after 1765 many day-to-day transactions could not be conducted in terms of banknotes; recourse to coins was necessary. Furthermore, the control of coinage rested with the Royal Mint and the Bank of England (Clapham 1958, Vol. II, 51–53). In other words, Scottish banks were systematically excluded from competition by means of notes for the business of those whose currency needs were relatively small in scale.

This restriction likely had two further effects. It may have served as a barrier to entry for small banks, since it could deny them the "niche strategy" of catering to small entrepreneurs and to the less wealthy consumers. Further-

more, since small-denomination notes always tend to circulate more rapidly than those of large denominations (White 1984a, 8), it would seem that the Act of 1765 must have reduced to some extent the effectiveness of the reflux process. That is, it may have raised the average period of circulation for Scottish banknotes and, thereby, increased the possibility of inflationary overissues. Consistent with this hypothesis, one finds Adam Smith's observation in 1776 that in Scotland, "the circulation has frequently been over-stocked with paper money" (1937, 286). One may add to this the facts that (1) food prices fell from 1717 to 1750 but rose strongly in the latter part of the eighteenth century, as did coal, cattle, and grain prices, and (2) Scottish net exports declined after 1775 and were generally negative from 1780 to 1805 (Lythe and Butt 1975, 102, 103, 113, 116, 117, 162, 247). All of this suggests—but does not prove—the existence of an inflationary monetary expansion.

Interest Rate Ceilings

In 1714 the Usury Law, to which the Scottish banks were subject, established a legal maximum rate of 5 percent to be charged by financial institutions. The last remnants of this law did not disappear until 1854 (Clapham 1958, Vol. II., 224). Of these facts, there can be no doubt. However, White has questioned, first of all, whether the 5 percent ceiling applied to one of the key sources of revenue for Scottish banks: the discounting of commercial bills of exchange (letter to Peter Lewin and the author, April 30, 1986). It did indeed. The Usury Law was applicable to "the entire bill market" until 1833, when ninety-day bills were made exempt (Homer 1963, 205).

Also, in the same letter cited above, White wonders if this ceiling was ever a binding constraint. If one takes that phrase to denote a circumstance in which market rates of interest are driven above the maximum legal rate, then one must apparently answer in the affirmative. S. G. E. Lythe and J. Butt, while discussing Scottish finance in the eighteenth century, note that "the price for capital might be higher than the legal maximum bank rate" (1975, 155). Since consols¹⁶ issued by the British government were not subject to the Usury Law (Homer 1963, 205), one might take the yield on consols to be a reflection of market conditions. That yield exceeded 5 percent in the years 1781, 1782, 1784, and 1796–1799 (Homer 1963, 161–62). During the long Napoleonic Wars (1793–1815), effective market rates were often above the maximum legal rate (Homer 1963, 186, 205).¹⁷ Short-term market rates also rose above 5 percent during the years 1836, 1837, and 1839–1841 (Homer 1963, 208). However, it is unclear whether the latter posed an impediment to bank competition, since bills of exchange and promissory notes were exempt from the Usury Law after 1833 (Checkland 1975, 192, 443). It is possible that short-term rates were greater than 5 percent during part of 1826 as well: The average of such rates for that year was 4.5 percent (Mitchell 1988, 683).

It would seem that the interest rate ceiling must, in fact, have been a con-

straint on bank competition during at least part of the 1765–1845 period. Checkland concurs when he states that “the Usury Law limited competition for deposits” and that its effect on “any form of advance was seriously inhibitive” (1975, 432, 192). This assessment is echoed by Meulen (1934, 92).

Privileged Banks

One may recall White’s definition of free banking as a system of “unprivileged private banks.” Yet there were two tiers to the Scottish system: (1) three chartered “public” institutions (the Bank of Scotland, the Royal Bank, and the British Linen Bank) and (2) the various private banks and joint stock banking companies. Since the three public banks enjoyed limited shareholder liability while the others were all subject to unlimited liability, Checkland concludes that the former “were in a preferred position relative to all others” (1975, 235). The state had created these public banks and “continued to confirm their preferred position through their limited liability and through their public identity and perpetual succession” (Checkland 1975, 275). It would thus seem that the nonchartered banks faced a significant regulatory barrier to entry: unlimited liability.¹⁸ This did not prevent the formation of a number of private banking concerns, but it imposed a constraint on such firms that was not applicable to the three chartered banks.

White contests this. He asserts that unlimited liability must not have been a binding constraint on the private banks, because they “chose to retain unlimited liability in the 1860s and 70s even after limited liability became available to them” (1984a, 143). To argue thus is less than convincing. Institutional structures must be viewed contextually. The fact that Scottish banks of the 1860s seem not to have seen unlimited liability as an odious imposition does not prove that it was not considered to be such in, say, 1780 or 1810. By 1860, the tradition of unlimited liability may have become so deeply entrenched that to abandon it would have shaken consumer confidence. Despite this, unlimited liability may still have been a barrier to entry during the eighteenth and early nineteenth centuries. In addition, there is a powerful counterpoint that one must consider. Since the three public banks expended real resources in order to (1) obtain their charters and (2) prevent other banks from gaining charters, one must conclude that a limited liability bank charter was perceived as conferring some significant advantage upon its holder (Cowen and Kroszner 1989, 226).

A specific manifestation of said advantage was the fact that “there was a long-standing government instruction to the officers of the customs to accept only the notes of the chartered banks in payment of duties, and to ‘refuse the Notes of every other bank without exception’ ” (Checkland 1975, 186). In short, an artificial demand for the notes of the public banks was established by fiat. Yet one might wonder if the payment of customs duties was of a magnitude sufficient to produce a significant gain for those institutions. One possible

indication is the proportion of total government revenues represented by customs duties. One finds that customs duties averaged 22.3 percent of annual government income over the period 1765–1801 and 27.6 percent from 1802 to 1845 (Mitchell 1988, 576–77, 581–82).¹⁹ The collection of customs duties—and therefore the benefit to the public banks—seems not to have been trivial.

Dependence upon the Bank of England

Several writers have argued that the Scottish system was not true free banking because it was crucially dependent upon the Bank of England. That is, it has been claimed that the private Scottish banks depended upon the three public banks, and those three in turn relied upon the Bank of England for their liquidity needs (Rothbard 1988b;²⁰ Sechrest 1988; Cowen and Kroszner 1989; Dow and Smithin 1992²¹). These arguments have been based on various statements by historians of the period.

For example, Checkland declares that “by 1810, the Bank of England, short of the state itself, was the effective final arbiter of the supply of liquidity, both for England and Scotland” (1975, 276). Meulen notes that “it transpired that at times when gold was being drained both from Scottish and English banks the Scottish bankers had not restricted their note issue, but had withdrawn gold from the Bank of England to support their credit system” (1934, 141). Furthermore, the 1810 Bullion Committee’s report stated that “the circulation of the Bank of England had an important influence on the circulation of the country banks and of the Scottish banks” (quoted in Fetter 1965, 50). Finally, “the three chartered banks of Scotland kept their reserves largely in deposits with the Bank of England” (Fetter 1965, 34).

White has offered a rebuttal to the foregoing that is quite plausible even if not conclusive (1989a, 20–34). He seems to make three key assertions. First, White points out that the evidence for the pyramiding of Scottish bank notes on a base of Bank of England notes is sketchy and circumstantial.²² There seem to be no unambiguous data that could resolve the question. Second, he grants that England and Scotland formed an integrated economic whole,²³ but denies that this means that the Scottish system was a satellite of the Bank of England. As he puts it, one would not conclude that the U.S. banking system was a satellite of the English system just because actions by the Bank of England had spill-over effects in America. Finally, White offers evidence that the Bank of England did not explicitly consider itself to be a lender of last resort during the Scottish free-banking period. He argues persuasively that there is an important distinction between an *ex ante* lender of last resort and an *ex post* source of liquidity. One might call the former structural dependence and take it to be indicative of central banking. One might call the latter circumstantial reliance and perceive it as being consistent with free banking.

SUMMARY

Lawrence H. White's very valuable research into Scottish free banking has generated much interest and some controversy. His work has explicitly suggested that the Scottish experience can tell us a great deal about how a true free-banking system would perform. To many writers, Scotland has come to represent the paradigmatic "test" of free banking.

However, on closer inspection, one finds some serious flaws in the Scottish system. The failure rate (1772–1830) for Scottish banks was not lower than that for English banks. Banknotes were not consistently convertible into specie on demand. The prohibition of small-denomination notes not only curtailed mutually beneficial transactions between banks and their customers, but also may have diluted the constraints on overissue. The Usury Law limited competition in credit markets. The three chartered banks held privileged positions within the system, and Scotland seems to have avoided neither the inflation nor the numerous crises that plagued the English.²⁴ Doubts about White's interpretation of the Scottish experiment with free banking seem justified.²⁵ Finally, it is interesting to notice that White himself seems to be retreating a bit from his original position. Instead of speaking of free banking as lasting from 1765 to 1845, he now appears only to defend the period 1810–1844 as exemplifying free banking (1989a, 15, 16, 35).

NOTES

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1. The key works are probably Hayek (1978), White (1984a), Selgin (1988a), and Dowd (1989).
2. All of these included other restrictions on bank activity, however.
3. One of the rare exceptions was Vera C. Smith (1990).
4. These three large, chartered banks—the Bank of Scotland, the Royal Bank, and the British Linen Bank—were distinct from other Scottish banking concerns and were referred to as "public banks." Whether these three were legally privileged is one of the controversies to be addressed.
5. This was true of all except the Bank of Scotland, the Royal Bank, and the British Linen Bank. The shareholders of those three were subject to limited liability.
6. The author would like to emphasize that he has great respect for White's work in general, but is unable to dispel certain doubts about White's view of Scottish free banking. Moreover, these doubts only very slowly displaced an initial enthusiasm for White's conclusions.
7. Simply put, the question is "how good" a test of free banking was the Scottish case. This is important, but it is, admittedly, a question of degree rather than of kind.
8. Most assume that success is achieved by a *low* rate of failure. A few economists—particularly Murray Rothbard—argue that *high* failure rates are desirable as an indication of market restraint.
9. That is one of the reasons why the author started his series with 1772.

10. It would have been far preferable to present data for Scotland alone, but such a series seems not to exist.
11. Neither edition of the *Wealth of Nations* possessed by the author is that which is cited by White. It is possible that some small—but in this case important—difference exists between the editions consulted.
12. It would be fair to keep in mind that Smith was writing in 1776. His comments do not, therefore, necessarily apply to the mature Scottish system. On the other hand, White seems willing to consider 1716 as the beginning of free banking (1991, 811–12). From that perspective, Smith's comments would apply.
13. Arguments in defense of option clauses and indirect convertibility within the context of free banking will be discussed in Chapter 7.
14. This is not surprising, since Dowd is not reasoning from the same model that White employs.
15. Cowen and Kroszner (1989, 224) cite an estimate of \$200.
16. Consols are bonds that never mature but pay interest to the holder forever.
17. Considering the substantial inflation in Britain during the period, it is hardly surprising that this should be the case. See Brian Mitchell (1988, 720).
18. See Carr and Mathewson (1988) for more on this issue.
19. These figures are for Great Britain as a whole; separate series for Scotland do not exist.
20. Rothbard's essay, though shrill in tone, nevertheless raises some worthwhile points. Most important of these is his claim that White has misinterpreted the theoretical debate over free banking. To the author's knowledge, Rothbard is the only one who has challenged White on this issue.
21. Sheila Dow and John Smithin also argue that the Scottish system exhibited a strong tendency toward concentration. This they applaud, for they ascribe the degree of success the Scots enjoyed to the *lack* of competition in the conventional sense.
22. White allows for the possibility that such pyramiding might have occurred during the 1797–1821 period (1989a, 22).
23. White recognizes that his earlier work may have led readers to conclude that he believed Scotland to be an entirely autonomous economy relative to England (1989a, 33).
24. This brings one back to a key theoretical issue. Is a properly functioning free-banking system not capable of at least mitigating the effects of external shocks? The author would argue that true free banking *is* capable of this. To test the stability of the Scottish system in a clear fashion, one would need separate series for Scottish prices, interest rates, industrial production, employment, and national income. To repeat, these do not appear to exist.
25. The author's position has long been that the theoretical case for free banking need not rely on evidence from ambiguous historical cases like that of Scotland.

Chapter 6

AMERICAN FREE BANKING

The previous chapter presented reasons why one should question Lawrence H. White's popular portrait of Scottish free banking. Scottish banking seems to have been both less free and less successful than White's work would lead one to believe. Here free banking in the United States will be examined. Once again, reasons will be given for rejecting the popular view, but in the other direction. American free banking will be shown to have been significantly safer and more stable than is usually believed to have been the case.

THE STANDARD STORY

The conventional viewpoint regarding the American free-banking period (1837–1863)¹ has been that it was “a failure,” “chaotic,” rife with fraud in the form of “wildcat” banking, and a “hindrance to economic development” (Rockoff 1975, i). Bruce R. Dalgaard describes the time as one in which “significant numbers of unstable banks had an image of ‘fly-by-night’ operations out to obtain quick deposits before closing shop and disappearing with depositors’ funds . . . many banks failed . . . excessive creation of bank notes and unsound bank practices caused or aggravated financial panics during this period” (1987, 95–96). Rollin G. Thomas insists that the “system of free banking led to many abuses. Principally, it facilitated the development of wildcat banking . . . the situation was further disturbed by the fact that counterfeiting of bank notes became popular. The multitude of issues made the practice easy . . . the widespread adoption of free banking led to complete chaos in many areas” (1946, 244–46). Furthermore, Phillip Cagan opines that “the nation could not so easily have achieved its rapid industrial and commercial expansion during

the second half of the 19th century with the fragmented currency system it had during the first half" (1963, 20).

The abuses allegedly perpetrated by some of these note-issuing free banks were indeed extreme. Charles J. Bullock claims that often "banks were located in inaccessible places, on some bottomless prairie road, or in the depths of forests, where it would prove as difficult as possible to find the 'offices' at which the notes were payable" (1900, 84). He adds that "in Ohio, Indiana, and Missouri, between 1855 and 1859, certain persons who presented notes for redemption were threatened with lynching or a coat of tar and feathers" (1900, 85).² A. Barton Hepburn asserts in reference to the state of New York from 1838³ to 1850 that "thirty-two banks failed, entailing a loss upon note holders of \$325,487, some paying as low a percentage as thirty cents on the dollar" (1903, 137–38).

In summary then, the conventional critique of American free banking is that (1) the multiplicity of notes led to fraud, with consumers often accepting at face value notes that were redeemable—if at all—at a fraction of that face value; (2) short-lived "wildcat"⁴ banks established by unscrupulous persons were commonly encountered; (3) there were high rates of bank failure with concomitantly large losses to noteholders; (4) the system more likely hindered than fostered economic development via the allocation of financial capital; and (5) free banking was both highly inflationary and highly unstable, for example, conducive to indiscriminate bank panics that had negative spill-over effects on real variables.

As will be seen, each of these charges has been subjected to criticism by recent researchers. What emerges is a very different image. Free banking in the United States—though certainly blemished—was far less chaotic than has been believed. Moreover, the imperfections that did exist were largely the result of regulatory restrictions.

SOME BASIC FACTS

To set the context for the discussion that follows, several bits of information must be conveyed. First of all, what were the basic provisions of the free-banking laws? One must realize that these statutes were enacted at the state level; each state made slightly different stipulations. Two things were universal: a bank must redeem its notes in specie on demand of the noteholder and either state or federal bonds must be purchased by the bank and held as security for its outstanding notes.⁵ Failure to redeem its notes brought about closure of the bank and liquidation of its assets. Noteholders were meant to be protected further by being granted first lien on bank assets. Some states—but not all—also required that free banks have some minimum level of capital. For example, this was \$100,000 in New York, and \$25,000 in both Wisconsin and Minnesota (Rolnick and Weber 1982a, 21). Other states required a minimum ratio of specie to notes. This seems not to have been considered an essential item,

however. New York imposed a 12.5 percent minimum reserve ratio in 1838 but repealed it in 1840, whereas Indiana eliminated a similar requirement in 1855 after having introduced it three years earlier (Rolnick and Weber 1982a, 21). Finally, although the precise conditions varied from state to state, free-bank stockholders faced limited liability. In some cases, this was twice the amount of their investment and might extend beyond the time they sold their stock.

Free banking was not permitted in all states. Some continued to require banks to petition the state legislature for permission to operate. That is, some states continued to require that a bank be chartered. This chartering system was one that had proven susceptible to extensive political abuse, however. Indeed, the favoritism and corruption associated with the chartering of banks was what had prompted the introduction of free banking in the late 1830s (Hepburn 1903, 136).

The extent of free banking may be indicated by the fact that, out of thirty-three states in the Union as of 1860, eighteen had free-banking statutes (Rockoff 1975, 3). Moreover, the expansion of American banking was largely due to the spread of free banking. In 1835, when all banks still had to have charters, there were 704 banks in the United States. In 1845, with two free-banking states, there were still only 707. By 1855—with fourteen free-banking states—there were 1,307 banks (see Table 3).

RECENT RESEARCH

Some of the most thorough and extensive modern research on American free banking has been that by Arthur J. Rolnick and Warren E. Weber. Their motivation is made clear: “The conclusion that when banking was left on its own it failed has very significant implications for regulatory policy and to a great extent influences policy today. Surprisingly, though, this conclusion is based on *very casual empiricism*” (emphasis added) (Rolnick and Weber 1982b, 10). As will be seen, they find “considerable evidence to question the prevailing views on free banking” (1982b, 10).

Failures, Longevity, and Noteholder Losses

In order to examine some of those “prevailing views,” Rolnick and Weber collected data from the state auditors’ reports for four free-banking states: New York, Minnesota, Indiana, and Wisconsin. These states allowed free banking for various time periods and, as a result, had various numbers of free banks that were formed under their statutes. New York had 449 banks (1838–1863), Minnesota had 16 (1858–1863), Indiana had 104 (1852–1863), and Wisconsin had 140 (1852–1863) (Rolnick and Weber 1982b, 19–20). This gives a total of 709 free banks. Of these, redemption information is available for 678, and the findings? “Close to fifty percent of the free banks in the states we investi-

Table 3
Number of Banks in the United States, 1815–1860

| Year | Banks | Year | Banks |
|------|-------|------|-------|
| 1815 | 208 | 1845 | 707 |
| 1816 | 246 | 1846 | 707 |
| 1820 | 307 | 1847 | 715 |
| 1829 | 329 | 1848 | 751 |
| 1830 | 330 | 1849 | 782 |
| 1834 | 506 | 1850 | 824 |
| 1835 | 704 | 1851 | 879 |
| 1836 | 713 | 1853 | 750 |
| 1837 | 788 | 1854 | 1,208 |
| 1838 | 829 | 1855 | 1,307 |
| 1839 | 840 | 1856 | 1,398 |
| 1840 | 901 | 1857 | 1,416 |
| 1841 | 784 | 1858 | 1,422 |
| 1842 | 692 | 1859 | 1,476 |
| 1843 | 691 | 1860 | 1,562 |
| 1844 | 696 | | |

Source: A. Barton Hepburn, History of Coinage and Currency in the United States and the Perennial Contest for Sound Money (New York: Macmillan, 1903) 118, 153, 174.

Notes: mean (1815–1849) = 630
mean (1850–1860) = 1,224
standard deviation (1815–1849) = 208.5
standard deviation (1850–1860) = 281.9
coefficient of variation (1815–1849) = 0.331
coefficient of variation (1850–1860) = 0.230

No data are available for 1817–1819, 1821–1828, 1831–1833, or 1852.

Coefficient of variation equals standard deviation divided by the mean.

gated failed, but less than a third of these banks failed to redeem their notes at par" (Rolnick and Weber 1982b, 11).⁶ Overall, then, less than one-sixth of the free banks in these four states failed to redeem their notes at par value.

Pursuing the issue of bank failures, it is interesting to compare free-bank rates of failure with failure rates of American banks during other time periods. For example, during the 1811–1830 period, there were 495 state-chartered/state-regulated banks. One-third of them failed (Gilbart 1967, 48–52), and this

was largely a period of peace and prosperity for the country. Closer to the present day is the 1921–1929 period. This was a time of real economic growth, low unemployment, and low rates of inflation⁷ in which banking was regulated, there was a lender of last resort, and the Federal Reserve was undertaking expansionary open market operations. Nevertheless, out of 29,669 banks, 5,411 failed (Upham and Lamke 1934, 247). In addition, it is well known that in mid-1929, there were about 25,000 U.S. banks. By mid-1933, almost 10,000 of them were gone. It is ironic to note in the context of the foregoing that Hugh Rockoff has referred to a failure rate of 15 percent as “high” (1985, 886).

As for the longevity of free banks, it is clear that many economists share Rockoff’s belief that it was common for a free bank to last for only a month or two (Rockoff 1975, 8–9). Rolnick and Weber find little support for this. They conclude that “our data suggest that the conventional view is overstated. In our free banking states, only sixteen percent of the free banks were in business under a year, while the average number of years in business was over five” (1982b, 13). The longer-term banks were to be found in New York and Wisconsin.⁸ “New York free banks were in existence a mean of 7.9 years . . . and Wisconsin free banks were in existence a mean of 4.3 years” (Rolnick and Weber 1982b, 14). Furthermore, these figures have a downward bias, since they do not include free banks that, after 1863, continued in business as chartered state or national banks (Rolnick and Weber 1982b, 14).

Perhaps the most fundamental concern for individual consumers is the safety of those banknotes they choose to hold, and the usual portrait of free banking has been one in which such safety was ephemeral to say the least. What have Rolnick and Weber discovered? They “found that the most exaggerated views about free banks were those concerning the safety of the bank notes and the losses to noteholders . . . some have claimed that the losses to noteholders ran into the millions for individual states. Our data, however, tell a much different story” (1982b, 15).

Rolnick and Weber calculated two different measures of note safety. The first is the “expected value of a randomly selected bank note held until 1863,” which they arrive at by multiplying the note circulation of each free bank by the rate at which those notes were ultimately redeemed and then dividing that number by the total circulation of all free banks (1982b, 15). By this measure, the free banks in New York were the safest since their notes’ expected value never fell below \$.97 per dollar. In Indiana, the lowest expected value was \$.92 in 1853, and in thirteen out of fifteen other years, the expected value was \$.98 or better (1982b, 15–16, 22–23). Minnesota fared worst. For the first six months of free banking in that state, the expected value of notes was no better than \$.50 per dollar. However, over the succeeding four years, that is, until the end of free banking in 1863, the expected value did not fall below \$.81.

Their other measure is an estimate of the total losses imposed on noteholders. This “was obtained by multiplying the last circulation for each bank which failed below par by one minus its redemption rate” (Rolnick and Weber 1982b,

16). They found that "the total losses to noteholders under free banking in the four states for which we have compiled data ranged between \$1.6 and 2.1 million" (1982b, 17). In other words, there were significant losses in some cases, but the magnitude of such losses was far less than previously believed. It must be pointed out that Rockoff has challenged the validity of Rolnick and Weber's work (Rockoff 1985). This, however, seems a weak challenge, since Rockoff offers very little data to support his claims.

Free-Banking Fraud

Very much a part of the traditional picture of free banking has been the allegation of widespread fraud. This allegation usually stems from what is a correct observation about the free-banking laws. It was true that such banks were required to buy state bonds (at *market* value) and deposit them with the state auditor as security for their notes, and then were allowed to issue notes in an amount equal to the *face* value of the bonds. The difference between the market and face values was often significantly large because of questionable state fiscal policies that led to a depreciation of the bonds. Supposedly, an unscrupulous banker would begin operations and, for a time, studiously redeem his notes on demand so as to foster public confidence in his bank. Then, when he had obtained an extensive circulation for his notes, he would suddenly cease redemption in specie—something made easy by locating his "office" in some remote area—and disappear. Where lay his gain? To the extent that he had persuaded consumers to exchange their specie for his notes at face value, he will have profited at their expense. This follows from the fact that said banker likely paid less than face value for the bonds. Therefore, his gain was the difference between (1) the dollars in gold he received in exchange for his notes and (2) the dollars in gold he expended in order to acquire the state bonds, less some small operating expenses.

This is essentially the explanation for free-bank failures offered by Rockoff (1975, 94–129). In effect, Rockoff contends that conscious attempts by bankers to defraud consumers were the source of most such failures. This kind of fraud was only possible when the bankers could purchase state bonds at market value but could issue notes based on the face value of those bonds. The obvious implication of Rockoff's hypothesis is that free-bank failures should have occurred only in states that exhibited this market value/face value differential.

Rolnick and Weber disagree with Rockoff's analysis. Their counterhypothesis is that free banks failed not because of fraud made possible by the counting of state bonds at face value, but rather because fluctuations in the market prices of those bonds often left free banks severely undercapitalized. They argue that this, coupled with the requirement that free banks redeem their notes and deposit accounts in specie, brought about the failures (Rolnick and Weber 1982a, 15, 19). The implication here is that free-bank failures should be most strongly

correlated with declines in the market prices of the state bonds held—regardless of whether note issuance was based on market values or face values.

To test the two hypotheses, Rolnick and Weber offer data on bank failures and bond prices for four states: New York, Wisconsin, Minnesota, and Indiana (1982a, 22–30). They find little support for Rockoff's position, since the majority of below par failures in those states occurred *after* the state laws were modified so as to restrict banks to note issues based on the market values of bonds held. For example, "over half of New York's below par failures occurred after the market valuation restriction had been incorporated into its free banking legislation" (Rolnick and Weber 1982a, 15). Furthermore, "all 37 of Wisconsin's below par failures occurred in 1860 and 1861 when the market valuation criterion was in effect" (Rolnick and Weber 1982a, 15). Half the Indiana failures were after the statutory change. Only the Minnesota data were ambiguous.

In contrast, they uncover substantial evidence that supports their theory regarding the source of free-bank failures. Plotting bond prices and bank failures, they observe that by "examining the data on below par failures during 1852–1863 for New York, Indiana, and Wisconsin, it can be seen that all but two of the 59 below par failures occur in" periods of substantial declines in the prices of bonds (Rolnick and Weber 1982a, 17). For Minnesota, the figure is two out of eleven below par failures (1982a, 25). Therefore, they conclude that free-bank failures were due not to fraud, but to the legal requirements that notes be backed by state bonds and notes be redeemed on demand in specie. The first imposed an unnecessarily risky portfolio on free banks; the second prevented free banks from passing capital losses on to noteholders (1982a, 19).⁹ Rolnick and Weber conclude the investigation with a provocative line of thought:

Our results also suggest that the so-called free banking acts were not really free. That is, this experience cannot be interpreted as a test of laissez-faire banking. . . . It is doubtful such a system would have evolved on its own. We suspect banking would have been a much safer business under a truly laissez-faire environment. (1982a, 19–20)

Notes as Mutual Fund Shares

A parallel issue regarding the likelihood of free-banking fraud is that of whether or not notes were typically accepted at face value by consumers. It would seem that the profitability of fraud is directly proportional to the frequency with which such acceptance occurs. The usual argument has been "that the public were either naive or misinformed. They accepted free bank notes at par even when it was apparent that the notes were risky" (Rolnick and Weber 1985, 34). Such gullibility is assumed, for example, by Rockoff (1975, 107–10).

Once again, Rolnick and Weber challenge the conventional argument. They suggest "that free bank notes were demanded because they were priced to reflect the expected value of their backing" (1985, 34). In other words, they

hypothesize that some free banks essentially acted as mutual funds, with their notes treated like mutual fund shares, that is, discounted to reflect perceived risk.

It is intriguing to notice in light of this that several recent writers have proposed laissez-faire systems in which mutual fund shares might replace traditional hand-to-hand currency. These writers include Fischer Black (1970), Eugene Fama (1980), and David Glasner (1989, 195–200).

To examine this issue empirically, Rolnick and Weber work from a data set based on free banking in the same four states relied upon previously—New York, Indiana, Wisconsin, and Minnesota. In the first three, the “intended objective of the free banking laws was achieved: free bank notes there were relatively safe and circulated close to par” (Rolnick and Weber 1985, 7). They base this judgment on measurements of expected rates of return (1985, 8). In New York, the loss per annum was only 0.03 percent or less for fifteen out of eighteen years. For Wisconsin, losses were zero except for 1860 and 1861, when all of that state’s bank failures occurred. Indiana’s losses were nearly zero, except for 1853 and 1854, when they were 7.47 percent and 4.95 percent, respectively.

The experience in Minnesota was, however, radically different. Rolnick and Weber estimate the annual rate of loss there to range from a low of 12.43 percent in January of 1860 to a high of 54.38 percent for January of 1859 (1985, 10). They ascribe this difference from the other three states to a peculiar feature of banking in Minnesota. In that state, “railroad bonds” could be used as security for a free bank’s notes (1985, 13–16). These were technically Minnesota state bonds, but, in fact, they were backed only by the railroads’ questionable ability to repay the bondholders. The whole arrangement came into being as an indirect means by which the state legislature could help finance railroad development. The critical point is that these bonds were obviously risky and, thus, so too were any notes backed by them. To illustrate this, Rolnick and Weber point out that these railroad bonds could be sold in Chicago only when discounted by 50 percent and when banks holding these bonds failed, the redemption rates on the notes of such banks were no better than 21.25 cents per dollar (1985, 15).

Obviously, “what needs to be explained for Minnesota is why people were willing to hold notes that were backed by such risky assets” (Rolnick and Weber 1985, 15). Their answer is that such notes were both initially issued and subsequently traded *below par*. Essentially, then, these banks “were acting as mutual funds by intermediating the large-denomination (\$1,000) railroad bonds, with the bank notes serving as shares in the mutual funds” (1985, 15). Rolnick and Weber emphasize that “the evidence from the auditor records, legislative testimony, and newspaper accounts about these banks” supports the idea that the public were well informed regarding the riskiness of the situation (1985, 26).

The lesson from Minnesota’s free-banking period is potentially very impor-

tant. Here was a newly formed, frontier state with a largely rural populace. Despite this, it proved impossible to circulate free-bank notes at par value when they were backed by risky assets. This suggests that laissez-faire banking is not necessarily plagued by an informational asymmetry that encourages fraud. The significance of such evidence lies in the fact that many apologists for central banking base part of their case on the assumption that such asymmetries are universal and ineradicable. See, for instance, Charles Goodhart (1988, 33–34, 63–66).

Bank Panics

Here Rolnick and Weber try to answer two important questions: What is meant when the claim is made that banking is “inherently unstable,” and were free banks in the United States inherently unstable? They remark that there exists “no agreement on a precise definition of *inherent instability in banking*” (emphasis in original) (1986, 881). They opt for what they deem to be the conventional view. That is, they take inherent instability to mean that bank panics can occur without economy-wide real shocks. Such panics allegedly occur because of either “intrinsic” or “extrinsic” uncertainty (Rolnick and Weber 1986, 881–82). Intrinsic uncertainty arises when, as a result of some local real shock, the value of some banks’ assets falls and some noteholders demand redemption in specie. If information is distributed unequally among the noteholders, the differences between sound and unsound banks will not be clear, and a general run may result. Extrinsic uncertainty occurs when some pervasive, economy-wide real shock changes individuals’ demand for banknotes relative to specie. The trouble spreads as noteholders begin to doubt the solvency of the banking system.

Rolnick and Weber gathered data for the period 1841–1861 in order to test for instability. First they isolated clusters of bank failures, and noted the presence or absence of any local real shocks so as to answer the question of whether instability stems from intrinsic or extrinsic uncertainty. Their assumption was that, if a local shock coincided with a cluster of failures, such failures should be attributed to intrinsic uncertainty (1986, 883). Fully 85 percent of the failures appeared consistent with the intrinsic uncertainty proposition (1986, 885). They explain that these failures seem to have followed whenever free banks became grossly undercapitalized because of devaluations of the state bonds such banks held as security (Rolnick and Weber 1986, 884–85). These devaluations resulted from default on debt by the states, the onset of the Civil War, or, in the case of Minnesota (discussed earlier), the failure of several railroads.

To see if instability was inherent in free banking, Rolnick and Weber determine whether failures in one state led to failures in other states (the so-called contagion effect). This is the test suggested by Milton Friedman and Anna Schwartz (1963, 308). They find no evidence of contagion (1986, 885–86). Specifically, in the period July–December 1854, one-fourth of all the free banks

in Indiana failed, yet only one out of 232 in New York failed and none in Wisconsin. Between June and September 1859, over half of the Minnesota free banks failed, but not one of the 390 such banks in New York, Indiana, and Wisconsin closed its doors. Between June of 1860 and June of 1861, more than a third of the Wisconsin free banks failed; only one free bank in New York and one in Indiana did likewise.

Rolnick and Weber suggest that the lack of contagious panics may be due to the informational nature of the bond requirement. For example, noteholders in New York knew that a drop in Indiana state bond prices would have no appreciable effect on the safety of New York free banks.¹⁰ They further propose that any regulatory structure that does not provide information on the market value of a bank's assets will prove incapable of preventing bank runs (Rolnick and Weber 1986, 889).

The Allocation of Funds

As Rockoff has put it, a "fundamental question concerning free banking might appear to be whether permitting free entry produced a more efficient allocation of capital" (1975, 50). There are indeed several bits of evidence that seem to support the belief that free banking did produce such an allocation. For example, in the West (everything from Ohio to the Pacific Ocean), the source of the people's enthusiasm for free banking was "that they perceived serious difficulties with allocations of bank capital achieved under state owned or state chartered banking systems" (Rockoff 1975, 50). The states in which such difficulties had manifested themselves included Indiana, Tennessee, Ohio, and Missouri (Rockoff 1975, 55–56).

Qualitative evidence like that just cited is not really sufficient. One would hope for quantitative data on the basis of which one might accept or reject the proposition of free-banking allocative efficiency. Rockoff suggests that one may assume such efficiency if there is evidence of competitive conditions.¹¹ Furthermore, he unearths three kinds of data that may serve to indicate the degree of competitiveness: (1) profit rates, (2) the number of banks per 100,000 inhabitants, and (3) the number of unincorporated banks (1975, 57–64). In Kentucky and Indiana, he finds "high" bank profit rates prior to the introduction of free banking. More telling are the data for Ohio. There profit rates fall significantly as soon as free banking is adopted, suggesting a more competitive market. Figures for bank-to-population density are quite ambiguous. The critical factor seems to be the degree of urbanization rather than the presence of free banking, since "this measure of competition is highest in New England and lowest in the South and West" (Rockoff 1975, 60). The numbers of private (unincorporated) banks are generally greater in free-banking states and lower in the others, suggesting that the level of competition was greater in those free-banking states.¹² Rockoff tentatively concludes that "New York City benefited from free banking in its competition with Boston and Philadelphia for financial leadership,

and that in the West free banking was, or at least appeared to be, a way of slowing the vexatious problem of how to allocate bank capital in a region of new settlement" (1975, 67).

Noteholder Safety

The degree to which a holder of free-bank notes experienced the risk of loss is, of course, one of the important issues regarding free banking. Earlier it was seen that noteholder losses may have been much smaller than was previously believed to be the case (Rolnick and Weber 1982b). Confirmation of such results may be found in the works of A. Barton Hepburn and Charles Conant.

Hepburn lists the total losses to noteholders in the state of New York from 1838 to 1861 as \$398,336 (1903, 137–38). Conant helpfully adds that the total note circulation in New York during that time period was approximately \$314 million (1927, 375). This represents an average loss per dollar held of a minuscule 0.127 percent. New York did indeed have one of the best free-banking systems—of that there is no doubt. Nevertheless, such small losses seem utterly incongruous in the context of the usual image of free banking. Moreover, this just deals with nominal balances. Over the 1838–1860 period, the purchasing power of each dollar in the United States rose, on average, by 15.6 percent.¹³ In other words, in New York noteholders on average experienced a *net gain* in terms of real balances, despite the losses resulting from free-bank failures. For a modern comparison, one may look at the 1968–1990 period. Federal Reserve noteholders suffered losses in purchasing power of almost 75 percent over that span,¹⁴ and that does not take into account the enormous cost to taxpayers of closing insolvent financial institutions.

Pursuing the issue of free banks' safety, one must ask what factor might be of primary importance to the typical noteholder. Rolnick and Weber are largely concerned with assets held in the form of state bonds. They suggest, as seen earlier, that when the market value of such bonds fell, free banks tended to fail. However, state bonds surely represented secondary reserves to free banks. Their primary reserves consisted of outside money, that is, specie. It was their ability to redeem notes (or demand deposits) in gold or silver coin that was the first line of defense against a bank run.¹⁵ Therefore, an examination of reserve ratios should shed some light on the question of free-bank safety.

Table 4 presents data on the reserve ratios for the American banking system for the period 1834–1860. Only four states had adopted free banking before 1850—one in 1837,¹⁶ two in 1838, and one in 1849. Thirteen additional states embraced free banking between 1850 and 1858, whereas one (Pennsylvania) did not permit free banking until 1860. Therefore, two subperiods might be recognized. From 1834 to 1849, there was a specie standard and banks often issued their own notes,¹⁷ but a bank had to be chartered by the state in which it operated. From 1850 to 1860, freedom of entry and exit was added to the

Table 4
American Bank Reserve Ratios, 1834–1860 (all banks)

| Year | Reserve Ratio | Year | Reserve Ratio |
|------|---------------|------|---------------|
| 1834 | 15.48% | 1848 | 20.56% |
| 1835 | 22.83 | 1849 | 21.02 |
| 1836 | 14.11 | 1850 | 18.59 |
| 1837 | 13.52 | 1851 | 17.30 |
| 1838 | 16.64 | 1852 | 15.48 |
| 1839 | 20.59 | 1853 | 17.28 |
| 1840 | 18.04 | 1854 | 16.50 |
| 1841 | 20.00 | 1855 | 14.50 |
| 1842 | 18.87 | 1856 | 14.68 |
| 1843 | 28.96 | 1857 | 12.90 |
| 1844 | 30.54 | 1858 | 22.34 |
| 1845 | 25.11 | 1859 | 23.83 |
| 1846 | 21.03 | 1860 | 18.12 |
| 1847 | 18.72 | | |

Sources: William Graham Sumner, A History of American Currency (New York: Greenwood Press, 1968) 188. Amasa Walker, The Science of Wealth: A Manual of Political Economy (New York: Kraus Reprint Company, 1969) 162.

Notes: mean (1834–1849) = 20.38%
mean (1850–1860) = 17.41%
standard deviation (1834–1849) = 4.62
standard deviation (1850–1860) = 3.14
coefficient of variation (1834–1849) = 0.227
coefficient of variation (1850–1860) = 0.180

idea of note-issuing banks on a specie standard. This was the heyday of free banking.

As can be seen, the average reserve ratios for the two subperiods do not differ greatly. They are 20.38 percent for 1834–1849 and 17.41 percent for 1850–1860. Also, one may note that the year-to-year variations (as measured by the coefficient of variation) are smaller for 1850–1860. One might protest, however, that these time-series data combine both free banks and chartered banks. Perhaps a cross-sectional approach would be preferable.

Table 5 provides that sort of comparison. There the states are divided into free-banking and chartered banking categories. One can see that the disparity between the average reserve ratios remains about the same: 14.9 percent for free banking and 17.2 percent for chartered banking. The variations for the free-banking states are slightly greater than those for the chartered banking states.

Table 5
American Bank Reserve Ratios as of January 1, 1860 (by state)

| Free Banking | | Chartered Banking | |
|---------------|---------------|-------------------|---------------|
| State | Reserve Ratio | State | Reserve Ratio |
| Louisiana | 38.6% | Missouri | 37.0% |
| Georgia | 23.7 | Kentucky | 23.4 |
| Tennessee | 23.0 | North Carolina | 22.1 |
| Indiana | 22.3 | Maryland | 21.4 |
| Alabama | 22.2 | Pennsylvania* | 21.3 |
| Iowa | 20.0 | Virginia | 16.7 |
| New York | 15.6 | South Carolina | 15.5 |
| Ohio | 15.2 | Maine | 10.0 |
| Massachusetts | 15.1 | Delaware | 9.9 |
| Florida | 10.5 | Rhode Island | 6.3 |
| New Jersey | 8.9 | New Hampshire | 5.7 |
| Connecticut | 7.5 | | |
| Wisconsin | 5.5 | | |
| Vermont | 4.2 | | |
| Michigan | 4.0 | | |
| Illinois | 2.3 | | |
| mean = 14.9% | | mean = 17.2% | |

Source: Amasa Walker, The Science of Wealth: A Manual of Political Economy, 1969, 163.

Notes: standard deviation (free banking) = 9.45
standard deviation (chartered banking) = 8.78
coefficient of variation
(free banking) = 0.634
coefficient of variation
(chartered banking) = 0.510

*Pennsylvania did not adopt free banking until after this date.

Clearly, chartered banks held slightly greater primary reserves. Whether or not the difference implies that chartered banks were significantly safer may be impossible to resolve. The common belief about free banking has been that the absence of government supervision led to fraud, inflation, and chaos, but if that were so, surely one would find that free banks often held very small specie reserves. Otherwise, how could free banking be (allegedly) so attractive to dishonest operators? Also, how could free banks manage to issue such excessive quantities of notes that serious inflation resulted? Such allegations should be questioned. It would appear plausible that holding a free bank's notes in antebellum America was no riskier than holding a chartered bank's notes.

At present, a common measure of a financial intermediary's prudence is its capital/asset ratio. Table 6 provides information on such a ratio for the period

Table 6

American Bank Capital Ratios, 1834–1860 (ratio of capital stock to sum of loans and discounts)

| Year | Capital Ratio | Year | Capital Ratio |
|------|---------------|------|---------------|
| 1834 | 61.7% | 1848 | 59.5% |
| 1835 | 63.3 | 1849 | 62.4 |
| 1836 | 55.1 | 1850 | 59.7 |
| 1837 | 55.4 | 1851 | 55.1 |
| 1838 | 65.4 | 1852 | ...* |
| 1839 | 66.5 | 1853 | 50.8 |
| 1840 | 77.4 | 1854 | 54.1 |
| 1841 | 81.1 | 1855 | 57.7 |
| 1842 | 80.3 | 1856 | 54.2 |
| 1843 | 89.9 | 1857 | 54.2 |
| 1844 | 79.6 | 1858 | 67.7 |
| 1845 | 71.4 | 1859 | 61.2 |
| 1846 | 63.1 | 1860 | 60.9 |
| 1847 | 65.4 | | |

Source: Charles A. Conant, A History of Modern Banks of Issue (New York: G.P. Putnam's Sons, 1927) 391.

Notes: mean (1834–1849) = 68.6%

mean (1850–1860) = 57.6%

standard deviation (1834–1849) = 9.88

standard deviation (1850–1860) = 4.67

coefficient of variation (1834–1849) = 0.144

coefficient of variation (1850–1860) = 0.081

*No data are available.

1834–1860.¹⁸ Chartered banks show an average capital ratio of 68.6 percent. Free banking exhibits an average of 57.6 percent. Again, this difference may not be large enough to suggest any significant differences in bank management policies. Furthermore, the ratios under free banking fluctuate noticeably less than they do under chartered banking. The coefficients of variation are 0.081 and 0.144, respectively.

The data on reserve ratios and capital ratios may not be conclusive, but they are suggestive, particularly when considered in conjunction with the conclusions of those researchers whose work was reviewed above. That is, free banking does not seem to have been the disaster it is usually thought to have been, despite the larger number of banks and the greater variety of banknotes that accompanied it.

SOME STYLIZED MACROECONOMIC FACTS

Recent research has argued that the traditional image of American free banking is seriously flawed. Both the prevalence of counterfeiting¹⁹ and fraud, and the magnitude of noteholder losses seem to have been badly overstated. Furthermore, the deficiencies of free banks are now thought to have stemmed largely from the legal requirement that such banks hold suboptimal asset portfolios of state bonds as security for their note issues and the restrictions on branching (White 1986).²⁰

Such research is wonderfully illuminating, but it is more or less microeconomic in nature. It is neither inferior nor defective; it is simply incomplete.²¹ It does not address the fundamental macroeconomic question: How stable was the economy as a whole? The traditional story about American free banking suggests a period of rapid and erratic money growth, that is, a monetary series that exhibited both severe fluctuations and a strongly positive secular trend. From that premise, one would be likely to infer that wholesale and consumer prices, interest rates, and stock prices exhibited a high degree of instability as well, and that little real economic growth occurred.²²

In contrast to the above, one finds the following provocative assertion by Richard Timberlake:

The banking and monetary system on the eve of the Civil War had enjoyed fifteen years of relative stability . . . records for the period 1845–1860 imply an economic tranquility. . . . Growth in bank credit and the stock of money was as orderly as it had been or would be in any other period of United States financial history. . . . Only the panic of 1857 rippled the surface, and even this event was short-lived and relatively harmless. . . . The Civil War put an end to these idyllic conditions. (1978, 84–85)

Which of these views is more nearly correct? The purpose of this section is to offer a tentative answer to that question.

The Data

Ideally, one would like to test the key implications of the model in Chapters 2 and 3. Those were that (1) nominal national income is maintained at all times, (2) the price level is stable except in the face of per-capita productivity changes, and (3) the market rate of interest remains equal to the natural rate. Sadly, there are insufficient data to test those specific propositions. One must be content with a “second-best” approach that is more general. Namely, the limited data compel one to investigate merely the question of general stability.

In order to examine the issue of relative macroeconomic stability during the free-banking period, data are offered on the monetary base per capita, the money supply per capita, wholesale prices, consumer prices, the commercial paper rate of interest, common stock prices, real income per capita, and industrial

output per capita. Data on unemployment rates are not included, because there seem to be no such series that reliably extend back beyond about 1890.²³ The stability of each of the first six series is calculated (using three different measures). Average annual rates of growth in income and industrial output are provided. Six different regimes in U.S. banking history are then compared in terms of the stability of monetary growth, commodity prices, interest rates, and stock prices, and the rate of real economic growth. The six regimes are the time of state chartering of banks (1835–1849),²⁴ the heyday of free banking (1850–1860), the Greenback era (1866–1878), the classical gold standard (1879–1914), the early days of the Federal Reserve, that is, prior to the domestic abandonment of the gold standard (1919–1932), and the modern Fed system (1959–1989). The war years 1861–1865 and 1915–1918²⁵ are excluded from consideration.

Several empirical issues must be addressed before proceeding to the results. First, some explanation of the three stability measures is in order. The measures used are the coefficient of variation (CV), the mean absolute percentage change (MAPC), and the mean net percentage change (MNPC). The standard deviation (or, alternatively, the variance) of a distribution is perhaps the most commonly used measure of stability. However, the standard deviation is not reliable when one is comparing the relative variation of distributions that have very different mean values. In such a case, one needs the coefficient of variation, which equals the standard deviation divided by the mean.

There is still a potential problem with the CV. It will not always distinguish between a series that has sharp period-to-period fluctuations but little secular trend, and a series with small period-to-period fluctuations but a strong (positive or negative) secular trend. Therefore, to make that distinction, the MAPC and MNPC are used.²⁶ The MAPC sums the absolute values of the percentage changes and divides by the number of periods. This gives a measure of short-run (period-to-period) stability. The MNPC is the absolute value of the sum of the percentage changes (positive changes net of negative changes) divided by the number of periods. It provides a measure of long-run stability in the sense that a mean-reverting series possesses long-run stability. In short, MAPC indicates the magnitude of the fluctuations, whereas MNPC indicates the magnitude of the secular trend.

Second, one must reiterate that the free-banking period is here taken to be 1850–1860 instead of 1837–1863. The justification is twofold: (1) As was mentioned in an earlier section, only four states—Michigan (1837), New York (1838), Georgia (1838), and Alabama (1849)—adopted free-banking statutes prior to 1850, and (2) the years of the Civil War are being excluded for the usual reason that wars grossly distort fundamental economic relationships.²⁷ Since a number of states never adopted free banking, however, on what grounds can one propose that free banking dominated the 1850–1860 period?

In 1860, the United States was composed of thirty-three states. Of those, eighteen had some variant of free banking (Rockoff 1975, 3). Indeed, there

were fourteen free-banking states by 1853 (out of thirty-one states altogether). Moreover, several of the most populous states were among those that embraced free banking: New York, Massachusetts, Pennsylvania, Ohio, Illinois, and Indiana, for example (Rockoff 1975, 4).²⁸ To be precise, out of a total resident population of 31,513,000 in 1860, 21,218,000 (67.3 percent) lived in free-banking states.²⁹ Finally, one should not overlook the fact that the prime financial center of the United States—New York³⁰—was in a state that had an excellent free-banking system that had been in operation since 1838. It would seem plausible that free banking did come to dominate the American monetary system between 1850 and 1860.

One will notice that in the accompanying tables, both the money supply and the monetary base are measured in per-capita terms. Considering the span of time covered—150 years—during which there were enormous population changes, a per-capita measure seems preferable to measuring the total money supply.³¹ Furthermore, these per-capita figures are broken down into both nominal and real balances. In addition, three different estimates for the period from 1835 to 1860 are cited. The desire is to gain a clear and comprehensive view of monetary movements, particularly for the free-banking era.

The commercial paper rate of interest is taken to represent “interest rates,” because it is one of the few interest rate series for which one can find data as far back in time as the 1830s³² and that is still of economic significance today.

Regarding stock prices, the reader may wonder why two different indexes are used. For the periods 1835–1860 and 1866–1878, the index is constructed from railroad common stock prices, whereas for all later periods, the well-known Standard and Poor index is used. The reliance upon railroad stock prices in the early periods is due to the fact that, although a crude index of industrial (mostly mining) stocks could have been constructed as far back as 1857, railroad stocks were of greater economic importance (Macaulay 1938, 139fn). Indeed, “until about 1909 the railroad stock market was the American security market par excellence” (Macaulay 1938, 139).

Data on both consumer prices and wholesale prices are presented. Greater credence is given to the wholesale price figures, however. It has been widely observed that, with regard to the nineteenth century, the extant information on wholesale prices is both more extensive and more reliable than that on consumer prices. Thus, in the tables to follow, all real magnitudes are derived from nominal magnitudes by using the wholesale price index.

Finally, per-capita figures for real national income and industrial production are included in order to compare rates of growth under the various monetary regimes.

The Results

Tables 7–10 provide figures for the money supply per capita (both nominal and real). The nominal money balances are on page 114.

Table 7

Money Supply per Capita, 1835–1860 (currency plus deposits)

| Year | Nominal | Real | Year | Nominal | Real |
|------|---------|---------|------|----------|---------|
| 1835 | \$14.52 | \$13.50 | 1848 | \$14.55* | \$16.49 |
| 1836 | 14.55* | 11.86 | 1849 | 17.04* | 19.32 |
| 1837 | 13.93* | 11.26 | 1850 | 15.49 | 17.16 |
| 1838 | 14.81* | 12.52 | 1851 | 16.96 | 19.01 |
| 1839 | 12.32* | 10.23 | 1852 | 18.12 | 19.15 |
| 1840 | 10.65* | 10.42 | 1853 | 19.62 | 18.81 |
| 1841 | 9.89* | 10.00 | 1854 | 19.15 | 16.50 |
| 1842 | 8.12* | 9.21 | 1855 | 19.52 | 16.50 |
| 1843 | 9.58* | 11.89 | 1856 | 20.36 | 18.04 |
| 1844 | 10.36* | 12.51 | 1857 | 16.43 | 13.76 |
| 1845 | 11.24* | 12.60 | 1858 | 23.13* | 23.13 |
| 1846 | 12.14 | 13.61 | 1859 | 21.23* | 20.78 |
| 1847 | 12.49 | 12.90 | 1860 | 17.61** | 17.61 |

Sources: Milton Friedman and Anna J. Schwartz, Monetary Statistics of the United States (New York: National Bureau of Economic Research, 1970) 220–24. U.S. Bureau of the Census, Historical Statistics of the United States, Colonial Times to 1970 (Washington, D.C.: Government Printing Office, 1975) Series A 6–8.

Notes: Estimates are as of the end of the year unless otherwise indicated.

Currency is taken to be the sum of banknotes and specie, as held by the public.

The nominal data were adjusted using the price indexes from Table 17.

* Represents an average of upper and lower estimates.

** Incorporates estimate of specie as of June 1860.

Nominal Money Balances: Real Money Balances:

| | |
|---------------------------|---------------------------|
| CV (1835–1849) = 0.1913 | CV (1835–1849) = 0.1990 |
| CV (1850–1860) = 0.1132 | CV (1850–1860) = 0.1280 |
| MAPC (1835–1849) = 10.378 | MAPC (1835–1849) = 10.981 |
| MAPC (1850–1860) = 11.607 | MAPC (1850–1860) = 14.847 |
| MNPC (1835–1849) = 1.855 | MNPC (1835–1849) = 3.460 |
| MNPC (1850–1860) = 1.415 | MNPC (1850–1860) = 1.325 |

Table 8

Money Supply per Capita, 1867–1914 (currency plus commercial bank deposits)

| Year | Nominal | Real | Year | Nominal | Real |
|------|---------|---------|------|----------|---------|
| 1867 | \$35.16 | \$20.18 | 1891 | \$ 62.44 | \$71.28 |
| 1868 | 32.55 | 19.16 | 1892 | 68.07 | 83.11 |
| 1869 | 32.37 | 19.93 | 1893 | 62.54 | 74.54 |
| 1870 | 32.30 | 22.25 | 1894 | 61.87 | 82.16 |
| 1871 | 33.95 | 24.28 | 1895 | 64.34 | 83.89 |
| 1872 | 37.72 | 25.80 | 1896 | 60.18 | 82.44 |
| 1873 | 37.72 | 26.38 | 1897 | 62.09 | 84.82 |
| 1874 | 36.15 | 26.68 | 1898 | 69.90 | 91.85 |
| 1875 | 37.61 | 29.64 | 1899 | 80.67 | 98.50 |
| 1876 | 36.13 | 30.54 | 1900 | 83.82 | 95.14 |
| 1877 | 34.97 | 30.68 | 1901 | 94.56 | 108.81 |
| 1878 | 32.53 | 33.26 | 1902 | 101.17 | 109.37 |
| 1879 | 33.71 | 34.82 | 1903 | 105.69 | 112.80 |
| 1880 | 39.40 | 36.65 | 1904 | 109.34 | 116.57 |
| 1881 | 46.16 | 41.66 | 1905 | 120.16 | 127.29 |
| 1882 | 49.11 | 42.30 | 1906 | 127.14 | 130.94 |
| 1883 | 51.96 | 47.85 | 1907 | 131.13 | 128.06 |
| 1884 | 49.91 | 49.91 | 1908 | 127.69 | 129.24 |
| 1885 | 50.07 | 54.78 | 1909 | 138.88 | 130.90 |
| 1886 | 53.21 | 60.33 | 1910 | 142.85 | 129.28 |
| 1887 | 55.37 | 60.58 | 1911 | 149.09 | 146.31 |
| 1888 | 55.57 | 60.08 | 1912 | 157.21 | 144.89 |
| 1889 | 57.35 | 65.84 | 1913 | 159.90 | 145.76 |
| 1890 | 61.98 | 70.27 | 1914 | 163.24 | 152.56 |

Sources: Milton Friedman and Anna J. Schwartz, A Monetary History of the United States, 1867–1960 (Princeton: Princeton University Press, 1963) 704–8. Historical Statistics of the United States, 1975, Series A 6–8.

Notes: The nominal data were adjusted using the price indexes from Table 17.

Nominal Money Balances:

CV (1867–1878) = 0.0594
 CV (1879–1914) = 0.4500
 MAPC (1867–1878) = 4.248
 MAPC (1879–1914) = 5.972
 MNPC (1867–1878) = 0.566
 MNPC (1879–1914) = 4.737

Real Money Balances:

CV (1867–1878) = 0.1748
 CV (1879–1914) = 0.3832
 MAPC (1867–1878) = 5.680
 MAPC (1879–1914) = 5.631
 MNPC (1867–1878) = 4.761
 MNPC (1879–1914) = 4.482

Table 9
Money Supply per Capita, 1919–1932 (currency plus commercial bank deposits)

| Year | Nominal | Real |
|------|----------|----------|
| 1919 | \$207.41 | \$ 95.27 |
| 1920 | 220.71 | 91.01 |
| 1921 | 195.27 | 127.38 |
| 1922 | 195.79 | 128.89 |
| 1923 | 202.92 | 128.43 |
| 1924 | 205.91 | 133.62 |
| 1925 | 220.13 | 135.38 |
| 1926 | 220.81 | 140.55 |
| 1927 | 217.30 | 144.96 |
| 1928 | 217.25 | 143.02 |
| 1929 | 216.96 | 144.93 |
| 1930 | 206.47 | 152.15 |
| 1931 | 190.54 | 166.27 |
| 1932 | 165.20 | 162.28 |

Sources: Milton Friedman and Anna J. Schwartz, A Monetary History of the United States, 1867–1960, 1963, 709–13. Historical Statistics of the United States, 1975, Series A 6–8.

Notes: The nominal data were adjusted using the price indexes from Table 17.

Nominal Money Balances:

$$\begin{aligned} CV &= 0.0728 \\ MAPC &= 4.471 \\ MNPC &= 1.547 \end{aligned}$$

Real Money Balances:

$$\begin{aligned} CV &= 0.1525 \\ MAPC &= 5.971 \\ MNPC &= 4.653 \end{aligned}$$

| <i>Using CV</i> | <i>Using MAPC</i> | <i>Using MNPC</i> |
|--------------------|--------------------|-------------------|
| (1867–1878) 0.0594 | (1867–1878) 4.248 | (1867–1878) 0.566 |
| (1919–1932) 0.0728 | (1919–1932) 4.471 | (1850–1860) 1.415 |
| (1850–1860) 0.1132 | (1959–1989) 4.838 | (1919–1932) 1.547 |
| (1835–1849) 0.1913 | (1879–1914) 5.972 | (1835–1849) 1.855 |
| (1879–1914) 0.4500 | (1835–1849) 10.378 | (1959–1989) 4.731 |
| (1959–1989) 0.4898 | (1850–1860) 11.607 | (1879–1914) 4.737 |

Table 10
Money Supply (M1) per Capita, 1959–1989 (an average of monthly observations)

| Year | Nominal | Real | Year | Nominal | Real |
|------|----------|----------|------|-----------|----------|
| 1959 | \$797.93 | \$836.40 | 1975 | \$1322.72 | \$756.27 |
| 1960 | 785.65 | 822.67 | 1976 | 1383.77 | 756.57 |
| 1961 | 788.56 | 829.19 | 1977 | 1474.64 | 759.34 |
| 1962 | 795.78 | 839.43 | 1978 | 1578.53 | 754.19 |
| 1963 | 808.56 | 855.62 | 1979 | 1681.65 | 714.08 |
| 1964 | 828.45 | 874.82 | 1980 | 1764.94 | 656.60 |
| 1965 | 853.20 | 883.23 | 1981 | 1869.80 | 637.29 |
| 1966 | 882.86 | 884.63 | 1982 | 1972.63 | 659.08 |
| 1967 | 909.14 | 909.14 | 1983 | 2170.20 | 716.00 |
| 1968 | 963.52 | 940.02 | 1984 | 2300.82 | 741.48 |
| 1969 | 1010.38 | 948.71 | 1985 | 2487.86 | 805.65 |
| 1970 | 1035.13 | 937.62 | 1986 | 2792.57 | 931.48 |
| 1971 | 1090.32 | 957.26 | 1987 | 3056.29 | 993.27 |
| 1972 | 1154.77 | 969.58 | 1988 | 3156.88 | 986.22 |
| 1973 | 1226.91 | 907.48 | 1989 | 3154.89 | 939.23 |
| 1974 | 1276.39 | 797.25 | | | |

Sources: Board of Governors of the Federal Reserve System, Division of Research and Statistics. U.S. Bureau of the Census, Statistical Abstract of the United States (Washington, D.C.: Government Printing Office, 1990) 7.

Notes: The nominal data were adjusted using the price indexes from Table 18.

The current definition of M1 was used throughout the data set.

Nominal Money Balances:

CV = 0.4898
MAPC = 4.838
MNPC = 4.731

Real Money Balances:

CV = 0.1210
MAPC = 3.790
MNPC = 0.525

Free banking performs rather well when stability is measured by either the CV or the MNPC, but very poorly per the MAPC. Actually, the model would lead one to expect something like this. That is, significant period-to-period changes in the money supply were often the means by which nominal national income was kept constant in that model. There should be no strong secular trend, however, and there is not (see the MNPC). The modern Fed does rather poorly, ranking sixth, third, and fifth in terms of the CV, the MAPC, and the MNPC, respectively. A surprise may be the classical gold standard. The traditional argument has been that the growth in money under such a structure must be quite stable because of the inelastic nature of the supply of gold. Yet these figures reveal a definite positive trend as well as some considerable period-to-period variation.

To see how robust these results are for free banking, two other series are offered, one from A. Barton Hepburn and one from Peter Temin. These are Tables 11 and 12, respectively. Once again, the tables show both nominal and real balances, but the summaries which follow are for nominal balances. Per Hepburn:

| | <i>Using CV</i> | | <i>Using MAPC</i> | | <i>Using MNPC</i> |
|-------------|-----------------|-------------|-------------------|-------------|-------------------|
| (1835–1849) | 0.2253 | (1835–1849) | 11.762 | (1835–1849) | 0.265 |
| (1850–1860) | 0.1069 | (1850–1860) | 9.930 | (1850–1860) | 5.401 |

Per Temin:

| | <i>Using CV</i> | | <i>Using MAPC</i> | | <i>Using MNPC</i> |
|-------------|-----------------|-------------|-------------------|-------------|-------------------|
| (1835–1849) | 0.1926 | (1835–1849) | 10.762 | (1835–1849) | 0.116 |
| (1850–1858) | 0.0867 | (1850–1858) | 10.460 | (1850–1858) | 4.159 |

With both the alternative series, free banking exhibits greater stability per the CV and the MAPC, and less stability per the MNPC, than with the Friedman and Schwartz data used originally. Overall, one might say that according to the Friedman and Schwartz series, free banking exhibited relatively less short-run stability and relatively more long-run stability than with the Hepburn and Temin series. However, the results remain broadly similar in all three cases.

Tables 13–16 contain figures for the monetary base per capita. As with the money supply data, the following figures are for nominal balances.

| | <i>Using CV</i> | | <i>Using MAPC</i> | | <i>Using MNPC</i> |
|-------------|-----------------|-------------|-------------------|-------------|-------------------|
| (1919–1932) | 0.0439 | (1867–1878) | 3.187 | (1919–1932) | 0.460 |
| (1850–1860) | 0.0543 | (1919–1932) | 3.572 | (1850–1860) | 1.446 |
| (1867–1878) | 0.1018 | (1879–1914) | 3.900 | (1879–1914) | 2.376 |
| (1879–1914) | 0.2218 | (1850–1860) | 4.625 | (1867–1878) | 3.187 |
| (1835–1849) | 0.2533 | (1959–1989) | 5.420 | (1835–1849) | 3.549 |
| (1959–1989) | 0.5279 | (1835–1849) | 9.453 | (1959–1989) | 5.259 |

Table 11
Money Supply per Capita (Hepburn Estimate), 1835-1860
(currency plus deposits)

| Year | Nominal | Real | Year | Nominal | Real |
|------|---------|---------|------|---------|---------|
| 1835 | \$14.82 | \$13.78 | 1848 | \$13.17 | \$14.93 |
| 1836 | 20.20 | 16.48 | 1849 | 12.37 | 14.03 |
| 1837 | 19.31 | 15.62 | 1850 | 14.75 | 16.33 |
| 1838 | 15.31 | 12.94 | 1851 | 17.02 | 19.08 |
| 1839 | 15.88 | 13.19 | 1852 |* |* |
| 1840 | 13.38 | 13.09 | 1853 | 17.83 | 17.10 |
| 1841 | 12.18 | 12.32 | 1854 | 20.90 | 18.00 |
| 1842 | 10.79 | 12.24 | 1855 | 20.23 | 17.10 |
| 1843 | 8.97 | 11.13 | 1856 | 20.56 | 18.21 |
| 1844 | 10.32 | 12.47 | 1857 | 21.66 | 18.14 |
| 1845 | 11.00 | 12.33 | 1858 | 17.45 | 17.45 |
| 1846 | 11.97 | 13.42 | 1859 | 19.36 | 18.94 |
| 1847 | 13.13 | 13.56 | 1860 | 19.77 | 19.77 |

Sources: A. Barton Hepburn, History of Coinage and Currency in the United States, 1903, 118-20, 153-54, 174. Historical Statistics of the United States, 1975, Series A 6-8.

Notes: Currency is taken to be the sum of banknotes and specie, as held by the public.

The nominal data were adjusted using the price indexes from Table 17.

*Incomplete data.

Nominal Money Balances:

CV (1835-1849) = 0.2253
CV (1850-1860) = 0.1069
MAPC (1835-1849) = 11.762
MAPC (1850-1860) = 9.930
MNPC (1835-1849) = 0.265
MNPC (1850-1860) = 5.401

Real Money Balances:

CV (1835-1849) = 0.1005
CV (1850-1860) = 0.0554
MAPC (1835-1849) = 7.103
MAPC (1850-1860) = 7.747
MNPC (1835-1849) = 0.548
MNPC (1850-1860) = 3.834

Table 12
Money Supply per Capita (Temin Estimate), 1835–1858
(currency plus deposits)

| Year | Nominal | Real | Year | Nominal | Real |
|------|---------|---------|------|---------|---------|
| 1835 | \$16.40 | \$15.26 | 1847 | \$13.13 | \$13.56 |
| 1836 | 17.90 | 14.60 | 1848 | 12.13 | 13.75 |
| 1837 | 14.64 | 11.84 | 1849 | 14.54 | 16.49 |
| 1838 | 14.76 | 12.48 | 1850 | 17.15 | 18.99 |
| 1839 | 12.89 | 10.71 | 1851 |* |* |
| 1840 | 10.86 | 10.63 | 1852 | 18.10 | 19.13 |
| 1841 | 9.81 | 9.92 | 1853 | 21.22 | 20.35 |
| 1842 | 8.61 | 9.76 | 1854 | 20.29 | 17.48 |
| 1843 | 10.23 | 12.69 | 1855 | 20.63 | 17.44 |
| 1844 | 10.94 | 13.21 | 1856 | 21.66 | 19.19 |
| 1845 | 11.94 | 13.39 | 1857 | 17.15 | 14.36 |
| 1846 | 12.84 | 14.39 | 1858 | 19.05 | 19.05 |

Sources: Peter Temin, The Jacksonian Economy (New York: W. W. Norton, 1969) 71, 159. Historical Statistics of the United States, 1975, Series A 6-8.

Notes: Currency is taken to be the sum of banknotes and specie, as held by the public.

The nominal data were adjusted using the price indexes from Table 17.

*No data provided.

Nominal Money Balances:

CV (1835–1849) = 0.1926
CV (1850–1858) = 0.0867
MAPC (1835–1849) = 10.762
MAPC (1850–1858) = 10.460
MNPC (1835–1849) = 0.116
MNPC (1850–1858) = 4.159

Real Money Balances:

CV (1835–1849) = 0.1492
CV (1850–1858) = 0.0942
MAPC (1835–1849) = 8.707
MAPC (1850–1858) = 13.059
MNPC (1835–1849) = 1.247
MNPC (1850–1858) = 3.184

Table 13
Monetary Base per Capita, 1835–1860

| Year | Nominal | Real | Year | Nominal | Real |
|------|---------|--------|------|---------|--------|
| 1835 | \$4.33 | \$4.03 | 1848 | \$5.36 | \$6.08 |
| 1836 | 4.73 | 3.86 | 1849 | 6.57 | 7.45 |
| 1837 | 5.50 | 4.45 | 1850 | 7.58 | 8.39 |
| 1838 | 5.36 | 4.53 | 1851 | 7.91 | 8.87 |
| 1839 | 4.98 | 4.14 | 1852 | 8.72 | 9.22 |
| 1840 | 4.37 | 4.28 | 1853 | 8.54 | 8.19 |
| 1841 | 4.53 | 4.58 | 1854 | 8.68 | 7.48 |
| 1842 | 4.88 | 5.53 | 1855 | 8.40 | 7.10 |
| 1843 | 5.27 | 6.54 | 1856 | 8.54 | 7.56 |
| 1844 | 4.92 | 5.94 | 1857 | 8.55 | 7.16 |
| 1845 | 4.77 | 5.35 | 1858 | 8.17 | 8.17 |
| 1846 | 5.64 | 6.32 | 1859 | 7.58 | 7.42 |
| 1847 | 5.09 | 5.26 | 1860 | 7.54 | 7.54 |

Sources: Milton Friedman and Anna J. Schwartz, Monetary Statistics of the United States, 1970, 220-24. Historical Statistics of the United States, 1975, Series A 6-8.

Notes: The nominal data were adjusted using the price indexes from Table 17.

Nominal:

CV (1835–1849) = 0.2533
 CV (1850–1860) = 0.0543
 MAPC (1835–1849) = 9.453
 MAPC (1850–1860) = 4.625
 MNPC (1835–1849) = 3.549
 MNPC (1850–1860) = 1.446

Real:

CV (1835–1849) = 0.1984
 CV (1850–1860) = 0.0845
 MAPC (1835–1849) = 12.246
 MAPC (1850–1860) = 7.625
 MNPC (1835–1849) = 5.288
 MNPC (1850–1860) = 0.463

Table 14
Monetary Base per Capita, 1867-1914

| Year | Nominal | Real | Year | Nominal | Real |
|------|---------|---------|------|---------|---------|
| 1867 | \$22.80 | \$13.09 | 1891 | \$22.27 | \$25.42 |
| 1868 | 20.28 | 11.94 | 1892 | 23.28 | 28.42 |
| 1869 | 19.49 | 12.00 | 1893 | 22.61 | 26.95 |
| 1870 | 19.00 | 13.09 | 1894 | 22.98 | 30.52 |
| 1871 | 18.96 | 13.56 | 1895 | 21.59 | 28.15 |
| 1872 | 18.63 | 12.74 | 1896 | 19.74 | 27.04 |
| 1873 | 18.21 | 12.73 | 1897 | 21.11 | 28.84 |
| 1874 | 18.19 | 13.42 | 1898 | 23.42 | 30.78 |
| 1875 | 17.19 | 13.55 | 1899 | 24.14 | 29.47 |
| 1876 | 16.37 | 13.84 | 1900 | 25.68 | 29.15 |
| 1877 | 16.08 | 14.11 | 1901 | 26.68 | 30.70 |
| 1878 | 15.88 | 16.24 | 1902 | 27.07 | 29.26 |
| 1879 | 15.93 | 16.46 | 1903 | 27.99 | 29.87 |
| 1880 | 18.60 | 17.30 | 1904 | 29.28 | 31.22 |
| 1881 | 20.55 | 18.55 | 1905 | 29.47 | 31.22 |
| 1882 | 21.28 | 18.33 | 1906 | 30.75 | 31.67 |
| 1883 | 21.89 | 20.16 | 1907 | 32.97 | 32.20 |
| 1884 | 21.47 | 21.47 | 1908 | 34.88 | 35.30 |
| 1885 | 21.76 | 23.81 | 1909 | 34.51 | 32.53 |
| 1886 | 20.63 | 23.39 | 1910 | 34.38 | 31.11 |
| 1887 | 21.23 | 23.23 | 1911 | 34.93 | 34.28 |
| 1888 | 21.64 | 23.39 | 1912 | 35.10 | 32.35 |
| 1889 | 21.34 | 24.50 | 1913 | 35.19 | 32.08 |
| 1890 | 21.66 | 24.56 | 1914 | 35.64 | 33.31 |

Sources: Milton Friedman and Anna J. Schwartz, A Monetary History of the United States, 1867-1960, 1963, 799-801. Historical Statistics of the United States, 1975, Series A 6-8.

Notes: The nominal data were adjusted using the price indexes from Table 17.

Nominal:

$$\begin{array}{ll}
 \text{CV (1867-1878)} & = 0.1018 \\
 \text{CV (1879-1914)} & = 0.2218 \\
 \text{MAPC (1867-1878)} & = 3.187 \\
 \text{MAPC (1879-1914)} & = 3.900 \\
 \text{MNPC (1867-1878)} & = 3.187 \\
 \text{MNPC (1879-1914)} & = 2.376
 \end{array}$$

Real:

$$\begin{array}{ll}
 \text{CV (1867-1878)} & = 0.0808 \\
 \text{CV (1879-1914)} & = 0.1831 \\
 \text{MAPC (1867-1878)} & = 4.878 \\
 \text{MAPC (1879-1914)} & = 4.905 \\
 \text{MNPC (1867-1878)} & = 2.168 \\
 \text{MNPC (1879-1914)} & = 2.171
 \end{array}$$

Table 15
Monetary Base per Capita, 1919–1932

| Year | Nominal | Real |
|------|---------|---------|
| 1919 | \$63.34 | \$29.10 |
| 1920 | 67.51 | 27.84 |
| 1921 | 60.25 | 39.30 |
| 1922 | 57.09 | 37.58 |
| 1923 | 59.64 | 37.75 |
| 1924 | 60.24 | 39.09 |
| 1925 | 60.66 | 37.31 |
| 1926 | 60.67 | 38.62 |
| 1927 | 60.25 | 40.19 |
| 1928 | 59.11 | 38.91 |
| 1929 | 58.47 | 39.06 |
| 1930 | 56.36 | 41.53 |
| 1931 | 59.01 | 51.49 |
| 1932 | 62.37 | 61.27 |

Sources: Milton Friedman and Anna J. Schwartz, A Monetary History of the United States, 1867-1960, 1963, 801-4. Historical Statistics of The United States, 1975, Series A 6-8.

Notes: The nominal data were adjusted using the price indexes from Table 17.

Nominal: **Real:**

| | |
|---------------------|---------------------|
| CV = 0.0439 | CV = 0.1982 |
| MAPC = 3.572 | MAPC = 9.144 |
| MNPC = 0.460 | MNPC = 6.614 |

Here free banking does very well in the long run, but only moderately well in the short run. The early Fed exhibits consistent stability (ranking first or second in each case), whereas the modern Fed ranks either fifth or sixth by all three measures.

Some might argue at this point that the long-run stability of the money supply under free banking seems to be attributable to the stability of the commodity base—gold—and thus is not indicative of the monetary stability of free banking per se. Throughout this book, however, the model of free banking that has been defended is that based on a specie standard. It has furthermore been suggested that the two may be inseparable (White 1985, 124–26). The most likely form of free banking in the future—and the *only* form that has existed in the past³³—is that which issues inside money redeemable in some commodity,

Table 16
Monetary Base per Capita, 1959–1989

| Year | Nominal | Real | Year | Nominal | Real |
|------|----------|----------|------|----------|----------|
| 1959 | \$244.62 | \$256.42 | 1975 | \$453.35 | \$259.21 |
| 1960 | 240.75 | 252.09 | 1976 | 481.42 | 263.21 |
| 1961 | 238.75 | 251.05 | 1977 | 514.33 | 264.85 |
| 1962 | 242.29 | 255.58 | 1978 | 555.66 | 265.48 |
| 1963 | 247.93 | 262.36 | 1979 | 593.72 | 252.11 |
| 1964 | 256.77 | 271.14 | 1980 | 638.05 | 237.37 |
| 1965 | 266.01 | 275.37 | 1981 | 671.71 | 228.94 |
| 1966 | 276.93 | 277.48 | 1982 | 707.25 | 236.30 |
| 1967 | 287.45 | 287.45 | 1983 | 763.39 | 251.86 |
| 1968 | 303.16 | 295.77 | 1984 | 819.28 | 264.03 |
| 1969 | 317.60 | 298.22 | 1985 | 873.73 | 282.94 |
| 1970 | 331.01 | 299.83 | 1986 | 941.70 | 314.11 |
| 1971 | 350.24 | 307.50 | 1987 | 1,025.02 | 333.12 |
| 1972 | 370.84 | 311.37 | 1988 | 1,093.50 | 341.61 |
| 1973 | 399.28 | 295.33 | 1989 | 1,128.76 | 336.04 |
| 1974 | 429.50 | 268.27 | | | |

Sources: Board of Governors of the Federal Reserve System, Division of Research and Statistics. U.S. Bureau of the Census, Statistical Abstract of the United States, 1990, 7.

Notes: The nominal data were adjusted using the price indexes from Table 18.

Nominal:

CV = 0.5279
MAPC = 5.420
MNPC = 5.259

Real:

CV = 0.1051
MAPC = 3.383
MNPC = 1.208

usually gold. In such a context, the stability of the commodity base is an attribute of free banking itself.

Tables 17 and 18 present data on the wholesale price index:

| <i>Using CV</i> | <i>Using MAPC</i> | <i>Using MNPC</i> |
|--------------------|-------------------|-------------------|
| (1850–1860) 0.1000 | (1879–1914) 4.316 | (1879–1914) 0.387 |
| (1879–1914) 0.1245 | (1959–1989) 4.695 | (1835–1849) 1.095 |
| (1835–1849) 0.1468 | (1850–1860) 5.822 | (1850–1860) 1.425 |
| (1866–1878) 0.1718 | (1866–1878) 5.922 | (1959–1989) 4.399 |
| (1919–1932) 0.2184 | (1835–1849) 6.195 | (1919–1932) 4.876 |
| (1959–1989) 0.4847 | (1919–1932) 7.916 | (1866–1878) 5.159 |

Furthermore, Tables 19 and 20 deal with the consumer price index:

| <i>Using CV</i> | <i>Using MAPC</i> | <i>Using MNPC</i> |
|--------------------|-------------------|-------------------|
| (1850–1860) 0.0436 | (1879–1914) 1.326 | (1879–1914) 0.128 |
| (1879–1914) 0.0506 | (1850–1860) 2.722 | (1850–1860) 0.775 |
| (1919–1932) 0.0791 | (1866–1878) 3.375 | (1835–1849) 1.433 |
| (1835–1849) 0.0865 | (1835–1849) 3.790 | (1919–1932) 1.584 |
| (1866–1878) 0.1156 | (1919–1932) 4.859 | (1866–1878) 3.375 |
| (1959–1989) 0.5174 | (1959–1989) 4.994 | (1959–1989) 4.994 |

The classical gold standard and the free-banking era clearly dominate the other periods with regard to commodity prices. That such stability characterized the 1879–1914 period has, of course, long been recognized. It is not often noticed that the 1850–1860 period also exhibited a high degree of price stability. As one can see from the above figures, the modern Fed performs very poorly, whereas the early Fed was only marginally better.

Tables 21–24 reveal the quarter-by-quarter movements in the commercial paper rate of interest:

| <i>Using CV</i> | <i>Using MAPC</i> | <i>Using MNPC</i> |
|--------------------|-------------------|-------------------|
| (1879–1914) 0.2138 | (1919–1932) 0.405 | (1850–1860) 0.002 |
| (1866–1878) 0.2804 | (1879–1914) 0.673 | (1879–1914) 0.017 |
| (1850–1860) 0.2945 | (1959–1989) 0.686 | (1959–1989) 0.019 |
| (1919–1932) 0.3071 | (1866–1878) 1.145 | (1836–1849) 0.022 |
| (1959–1989) 0.4264 | (1850–1860) 1.666 | (1866–1878) 0.041 |
| (1836–1849) 0.5507 | (1836–1849) 2.520 | (1919–1932) 0.065 |

The only period to rank near the top of the lists both short run and long run is the classical gold standard. The time of state chartering of banks does quite badly, whereas free banking exhibits large quarterly fluctuations but by far the smallest secular trend.

Tables 25–28 review common stock prices:

| <i>Using CV</i> | <i>Using MAPC</i> | <i>Using MNPC</i> |
|--------------------|--------------------|-------------------|
| (1866–1878) 0.1379 | (1866–1878) 7.251 | (1866–1878) 0.222 |
| (1835–1849) 0.1916 | (1850–1860) 9.591 | (1835–1849) 0.844 |
| (1850–1860) 0.2270 | (1879–1914) 10.020 | (1919–1932) 1.685 |
| (1879–1914) 0.2769 | (1835–1849) 11.398 | (1850–1860) 2.233 |
| (1919–1932) 0.4568 | (1959–1989) 11.480 | (1879–1914) 2.709 |
| (1959–1989) 0.5468 | (1919–1932) 21.167 | (1959–1989) 6.683 |

Table 17
Wholesale Price Index, 1835–1932 (1860=100)

| Year Index | Year Index | Year Index | Year Index |
|------------|------------|------------|------------|
| 1835 107.5 | 1858 100.0 | 1886 88.2 | 1909 106.1 |
| 1836 122.6 | 1859 102.2 | 1887 91.4 | 1910 110.5 |
| 1837 123.7 | 1860 100.0 | 1888 92.5 | 1911 101.9 |
| 1838 118.3 | 1866 187.1 | 1889 87.1 | 1912 108.5 |
| 1839 120.4 | 1867 174.2 | 1890 88.2 | 1913 109.7 |
| 1840 102.2 | 1868 169.9 | 1891 87.6 | 1914 107.0 |
| 1841 98.9 | 1869 162.4 | 1892 81.9 | 1919 217.7 |
| 1842 88.2 | 1870 145.2 | 1893 83.9 | 1920 242.5 |
| 1843 80.6 | 1871 139.8 | 1894 75.3 | 1921 153.3 |
| 1844 82.8 | 1872 146.2 | 1895 76.7 | 1922 151.9 |
| 1845 89.2 | 1873 143.0 | 1896 73.0 | 1923 158.0 |
| 1846 89.2 | 1874 135.5 | 1897 73.2 | 1924 154.1 |
| 1847 96.8 | 1875 126.9 | 1898 76.1 | 1925 162.6 |
| 1848 88.2 | 1876 118.3 | 1899 81.9 | 1926 157.1 |
| 1849 88.2 | 1877 114.0 | 1900 88.1 | 1927 149.9 |
| 1850 90.3 | 1878 97.8 | 1901 86.9 | 1928 151.9 |
| 1851 89.2 | 1879 96.8 | 1902 92.5 | 1929 149.7 |
| 1852 94.6 | 1880 107.5 | 1903 93.7 | 1930 135.7 |
| 1853 104.3 | 1881 110.8 | 1904 93.8 | 1931 114.6 |
| 1854 116.1 | 1882 116.1 | 1905 94.4 | 1932 101.8 |
| 1855 118.3 | 1883 108.6 | 1906 97.1 | |
| 1856 112.9 | 1884 100.0 | 1907 102.4 | |
| 1857 119.4 | 1885 91.4 | 1908 98.8 | |

Source: Historical Statistics of the United States, 1975, Series E 40-63.

Notes: The war years 1861–1865 and 1915–1918 are excluded.

| | |
|-------------------------|--------------------------|
| CV (1835–1849) = 0.1468 | MNPC (1835–1849) = 1.095 |
| (1850–1860) = 0.1000 | (1850–1860) = 1.425 |
| (1866–1878) = 0.1718 | (1866–1878) = 5.159 |
| (1879–1914) = 0.1245 | (1879–1914) = 0.387 |
| (1919–1932) = 0.2184 | (1919–1932) = 4.876 |

| |
|--------------------------|
| MAPC (1835–1849) = 6.195 |
| (1850–1860) = 5.822 |
| (1866–1878) = 5.922 |
| (1879–1914) = 4.316 |
| (1919–1932) = 7.916 |

Table 18
Wholesale Price Index, 1959–1989 (1967 = 100)

| Year | Index | Year | Index |
|------|-------|------|-------|
| 1959 | 95.4 | 1975 | 174.9 |
| 1960 | 95.5 | 1976 | 182.9 |
| 1961 | 95.1 | 1977 | 194.2 |
| 1962 | 94.8 | 1978 | 209.3 |
| 1963 | 94.5 | 1979 | 235.5 |
| 1964 | 94.7 | 1980 | 268.8 |
| 1965 | 96.6 | 1981 | 293.4 |
| 1966 | 99.8 | 1982 | 299.3 |
| 1967 | 100.0 | 1983 | 303.1 |
| 1968 | 102.5 | 1984 | 310.3 |
| 1969 | 106.5 | 1985 | 308.8 |
| 1970 | 110.4 | 1986 | 299.8 |
| 1971 | 113.9 | 1987 | 307.7 |
| 1972 | 119.1 | 1988 | 320.1 |
| 1973 | 135.2 | 1989 | 335.9 |
| 1974 | 160.1 | | |

Source: Various issues of the Survey of Current Business.

Notes: CV = 0.4847
 MAPC = 4.695
 MNPC = 4.399

Here the Greenback era totally dominates. Free banking does fairly well, better, for example, than the classical gold standard by all three measures. The modern Fed brings up the rear, with the early Fed doing slightly better.

In addition to the issue of relative stability, one might want to compare rates of economic growth across the various monetary regimes. Tables 29 and 30 show real national income per capita for selected years. For comparative purposes, one may consider the following figures for the average annual percentage change:

$$\begin{aligned}
 (1869-1879) &= +3.49 \\
 (1959-1989) &= +2.57 \\
 (1879-1907/1911) &= +2.10 \\
 (1839-1849) &= +1.61 \\
 (1849-1859) &= +1.37 \\
 (1919-1932) &= +0.68
 \end{aligned}$$

Table 19
Consumer Price Index, 1835–1932 (1860 = 100)

| Year | Index | Year | Index | Year | Index | Year | Index |
|------|-------|------|-------|------|-------|------|-------|
| 1835 | 114.8 | 1858 | 96.3 | 1886 | 100.0 | 1909 | 100.0 |
| 1836 | 122.2 | 1859 | 100.0 | 1887 | 100.0 | 1910 | 103.7 |
| 1837 | 125.9 | 1860 | 100.0 | 1888 | 100.0 | 1911 | 103.7 |
| 1838 | 118.5 | 1866 | 163.0 | 1889 | 100.0 | 1912 | 107.4 |
| 1839 | 118.5 | 1867 | 155.6 | 1890 | 100.0 | 1913 | 110.0 |
| 1840 | 111.1 | 1868 | 148.1 | 1891 | 100.0 | 1914 | 111.5 |
| 1841 | 114.8 | 1869 | 148.1 | 1892 | 100.0 | 1919 | 191.9 |
| 1842 | 107.4 | 1870 | 140.7 | 1893 | 100.0 | 1920 | 222.2 |
| 1843 | 103.7 | 1871 | 133.3 | 1894 | 96.3 | 1921 | 198.5 |
| 1844 | 103.7 | 1872 | 133.3 | 1895 | 92.6 | 1922 | 185.9 |
| 1845 | 103.7 | 1873 | 133.3 | 1896 | 92.6 | 1923 | 189.3 |
| 1846 | 100.0 | 1874 | 125.9 | 1897 | 92.6 | 1924 | 189.6 |
| 1847 | 103.7 | 1875 | 122.2 | 1898 | 92.6 | 1925 | 194.4 |
| 1848 | 96.3 | 1876 | 118.5 | 1899 | 92.6 | 1926 | 196.3 |
| 1849 | 92.6 | 1877 | 118.5 | 1900 | 92.6 | 1927 | 192.6 |
| 1850 | 92.6 | 1878 | 107.4 | 1901 | 92.6 | 1928 | 190.0 |
| 1851 | 92.6 | 1879 | 103.7 | 1902 | 96.3 | 1929 | 190.0 |
| 1852 | 92.6 | 1880 | 107.4 | 1903 | 100.0 | 1930 | 185.2 |
| 1853 | 92.6 | 1881 | 107.4 | 1904 | 100.0 | 1931 | 168.9 |
| 1854 | 100.0 | 1882 | 107.4 | 1905 | 100.0 | 1932 | 151.5 |
| 1855 | 103.7 | 1883 | 103.7 | 1906 | 100.0 | | |
| 1856 | 100.0 | 1884 | 100.0 | 1907 | 103.7 | | |
| 1857 | 103.7 | 1885 | 100.0 | 1908 | 100.0 | | |

Source: Historical Statistics of the United States, 1975, Series E 135-66.

Notes: The war years 1861–1865 and 1915–1918 are excluded.

| | |
|-------------------------|--------------------------|
| CV (1835–1849) = 0.0865 | MNPC (1835–1849) = 1.433 |
| (1850–1860) = 0.0436 | (1850–1860) = 0.775 |
| (1866–1878) = 0.1156 | (1866–1878) = 3.375 |
| (1879–1914) = 0.0506 | (1879–1914) = 0.128 |
| (1919–1932) = 0.0791 | (1919–1932) = 1.584 |

| |
|--------------------------|
| MAPC (1835–1849) = 3.790 |
| (1850–1860) = 2.722 |
| (1866–1878) = 3.375 |
| (1879–1914) = 1.326 |
| (1919–1932) = 4.859 |

Table 20
Consumer Price Index, 1959–1989 (1967 = 100)

| Year | Index | Year | Index |
|------|-------|------|-------|
| 1959 | 87.3 | 1975 | 161.2 |
| 1960 | 88.6 | 1976 | 170.5 |
| 1961 | 89.6 | 1977 | 181.5 |
| 1962 | 90.6 | 1978 | 195.4 |
| 1963 | 91.8 | 1979 | 217.4 |
| 1964 | 93.0 | 1980 | 246.7 |
| 1965 | 94.5 | 1981 | 272.4 |
| 1966 | 97.3 | 1982 | 289.1 |
| 1967 | 100.0 | 1983 | 298.4 |
| 1968 | 104.2 | 1984 | 311.1 |
| 1969 | 109.8 | 1985 | 322.2 |
| 1970 | 116.3 | 1986 | 328.4 |
| 1971 | 121.3 | 1987 | 340.4 |
| 1972 | 125.3 | 1988 | 354.2 |
| 1973 | 133.1 | 1989 | 371.3 |
| 1974 | 147.7 | | |

Source: Various issues of the Survey of Current Business.

Notes: CV = 0.5174
MAPC = 4.994
MNPC = 4.994

Free banking seems to do rather feebly in relative terms. However, one should note that (1) the Greenback era experienced its rapid growth at least in part because it was a period of recovery from a devastating war and (2) the massive expansion of the public sector in recent decades has surely introduced an upward bias into such measures of growth for the 1959–1989 period. A direct measure of production might be preferable. Tables 31 and 32 display indexes of industrial production per capita for selected years. The summary of the average annual percentage changes appears as follows:

$$\begin{aligned}
(1829/1839-1839/1849) &= +4.73 \\
(1839/1849-1849/1859) &= +4.31 \\
(1879-1914) &= +2.81 \\
(1959-1989) &= +2.45 \\
(1866-1878) &= +1.87 \\
(1919-1932) &= -2.24
\end{aligned}$$

Table 21

Commercial Paper Rate of Interest at Boston and New York, 1836-1860
 (an average of observed rates, by quarter)

| Quarter Rate | Quarter Rate | Quarter Rate | Quarter Rate |
|--------------|--------------|--------------|--------------|
| 1836Q1 10.7 | 1842Q2 8.0 | 1848Q3 14.5 | 1854Q4 12.3 |
| 1836Q2 14.5 | 1842Q3 7.4 | 1848Q4 15.5 | 1855Q1 10.2 |
| 1836Q3 20.5 | 1842Q4 6.7 | 1849Q1 12.0 | 1855Q2 7.6 |
| 1836Q4 28.0 | 1843Q1 5.7 | 1849Q2 10.5 | 1855Q3 7.2 |
| 1837Q1 18.7 | 1843Q2 4.7 | 1849Q3 8.3 | 1855Q4 10.9 |
| 1837Q2 22.7 | 1843Q3 3.8 | 1849Q4 9.5 | 1856Q1 10.2 |
| 1837Q3 7.3 | 1843Q4 3.8 | 1850Q1 8.9 | 1856Q2 7.7 |
| 1837Q4 8.0 | 1844Q1 4.2 | 1850Q2 8.2 | 1856Q3 7.8 |
| 1838Q1 12.7 | 1844Q2 5.0 | 1850Q3 7.5 | 1856Q4 9.8 |
| 1838Q2 10.4 | 1844Q3 5.1 | 1850Q4 7.5 | 1857Q1 9.3 |
| 1838Q3 6.3 | 1844Q4 5.1 | 1851Q1 7.4 | 1857Q2 7.8 |
| 1838Q4 7.1 | 1845Q1 5.7 | 1851Q2 7.7 | 1857Q3 14.3 |
| 1839Q1 7.5 | 1845Q2 5.8 | 1851Q3 11.5 | 1857Q4 13.3 |
| 1839Q2 8.0 | 1845Q3 6.0 | 1851Q4 12.2 | 1858Q1 6.4 |
| 1839Q3 14.3 | 1845Q4 6.8 | 1852Q1 7.8 | 1858Q2 4.6 |
| 1839Q4 23.1 | 1846Q1 8.0 | 1852Q2 5.9 | 1858Q3 4.2 |
| 1840Q1 10.0 | 1846Q2 10.2 | 1852Q3 6.0 | 1858Q4 4.7 |
| 1840Q2 7.8 | 1846Q3 5.3 | 1852Q4 6.0 | 1859Q1 5.6 |
| 1840Q3 6.4 | 1846Q4 6.7 | 1853Q1 9.2 | 1859Q2 6.4 |
| 1840Q4 6.5 | 1847Q1 9.7 | 1853Q2 9.1 | 1859Q3 7.0 |
| 1841Q1 6.5 | 1847Q2 7.7 | 1853Q3 9.8 | 1859Q4 7.4 |
| 1841Q2 6.2 | 1847Q3 7.8 | 1853Q4 12.9 | 1860Q1 7.1 |
| 1841Q3 6.2 | 1847Q4 13.0 | 1854Q1 8.5 | 1860Q2 4.8 |
| 1841Q4 8.3 | 1848Q1 15.5 | 1854Q2 10.7 | 1860Q3 5.8 |
| 1842Q1 10.5 | 1848Q2 15.0 | 1854Q3 10.0 | 1860Q4 9.6 |

Source: Walter B. Smith and Arthur H. Cole,
Fluctuations in American Business, 1790-1860
 (Cambridge, Mass.: Harvard University Press, 1935)
 192-94.

Notes: CV (1836Q1-1849Q4) = 0.5507
 CV (1850Q1-1860Q4) = 0.2945
 MAPC (1836Q1-1849Q4) = 2.520
 MAPC (1850Q1-1860Q4) = 1.666
 MNPC (1836Q1-1849Q4) = 0.022
 MNPC (1850Q1-1860Q4) = 0.002

Table 22

Commercial Paper Rate of Interest at New York City, 1866–1914 (an average of observed rates, by quarter)

| Quarter Rate | Quarter Rate | Quarter Rate | Quarter Rate |
|--------------|--------------|--------------|--------------|
| 1866Q1 7.32 | 1878Q2 4.57 | 1890Q3 5.46 | 1902Q4 5.90 |
| 1866Q2 6.10 | 1878Q3 4.01 | 1890Q4 6.66 | 1903Q1 5.07 |
| 1866Q3 5.68 | 1878Q4 5.21 | 1891Q1 5.36 | 1903Q2 5.02 |
| 1866Q4 6.34 | 1879Q1 4.40 | 1891Q2 5.32 | 1903Q3 5.79 |
| 1867Q1 7.22 | 1879Q2 4.71 | 1891Q3 5.71 | 1903Q4 5.89 |
| 1867Q2 7.07 | 1879Q3 5.08 | 1891Q4 5.16 | 1904Q1 4.78 |
| 1867Q3 6.72 | 1879Q4 6.05 | 1892Q1 3.94 | 1904Q2 3.86 |
| 1867Q4 8.30 | 1880Q1 5.40 | 1892Q2 3.19 | 1904Q3 3.91 |
| 1868Q1 7.08 | 1880Q2 5.08 | 1892Q3 4.05 | 1904Q4 4.27 |
| 1868Q2 6.78 | 1880Q3 4.91 | 1892Q4 5.27 | 1905Q1 3.91 |
| 1868Q3 6.62 | 1880Q4 5.52 | 1893Q1 5.62 | 1905Q2 3.90 |
| 1868Q4 8.56 | 1881Q1 5.39 | 1893Q2 6.97 | 1905Q3 4.35 |
| 1869Q1 8.47 | 1881Q2 4.25 | 1893Q3 9.92 | 1905Q4 5.45 |
| 1869Q2 9.11 | 1881Q3 4.88 | 1893Q4 4.65 | 1906Q1 5.12 |
| 1869Q3 10.25 | 1881Q4 6.27 | 1894Q1 3.27 | 1906Q2 5.34 |
| 1869Q4 10.83 | 1882Q1 5.54 | 1894Q2 2.98 | 1906Q3 5.99 |
| 1870Q1 7.96 | 1882Q2 5.01 | 1894Q3 3.12 | 1906Q4 6.27 |
| 1870Q2 6.34 | 1882Q3 5.67 | 1894Q4 2.81 | 1907Q1 6.09 |
| 1870Q3 6.94 | 1882Q4 6.35 | 1895Q1 3.54 | 1907Q2 5.62 |
| 1870Q4 7.76 | 1883Q1 5.75 | 1895Q2 3.12 | 1907Q3 6.27 |
| 1871Q1 6.70 | 1883Q2 5.55 | 1895Q3 3.48 | 1907Q4 7.39 |
| 1871Q2 5.78 | 1883Q3 5.46 | 1895Q4 4.55 | 1908Q1 5.74 |
| 1871Q3 5.65 | 1883Q4 5.73 | 1896Q1 5.68 | 1908Q2 4.01 |
| 1871Q4 9.75 | 1884Q1 4.75 | 1896Q2 4.68 | 1908Q3 3.76 |
| 1872Q1 8.16 | 1884Q2 5.18 | 1896Q3 7.05 | 1908Q4 3.98 |
| 1872Q2 7.29 | 1884Q3 5.65 | 1896Q4 5.81 | 1909Q1 3.58 |
| 1872Q3 8.00 | 1884Q4 5.23 | 1897Q1 3.21 | 1909Q2 3.40 |
| 1872Q4 11.08 | 1885Q1 4.55 | 1897Q2 3.39 | 1909Q3 3.87 |
| 1873Q1 9.59 | 1885Q2 3.73 | 1897Q3 3.74 | 1909Q4 5.06 |
| 1873Q2 8.78 | 1885Q3 3.64 | 1897Q4 3.66 | 1910Q1 4.56 |
| 1873Q3 9.26 | 1885Q4 4.31 | 1898Q1 3.67 | 1910Q2 4.81 |
| 1873Q4 13.60 | 1886Q1 4.03 | 1898Q2 4.55 | 1910Q3 5.45 |
| 1874Q1 6.53 | 1886Q2 4.05 | 1898Q3 3.80 | 1910Q4 5.24 |
| 1874Q2 5.82 | 1886Q3 4.98 | 1898Q4 3.25 | 1911Q1 3.98 |
| 1874Q3 5.77 | 1886Q4 5.98 | 1899Q1 3.27 | 1911Q2 3.65 |
| 1874Q4 5.81 | 1887Q1 5.22 | 1899Q2 3.53 | 1911Q3 4.17 |
| 1875Q1 5.45 | 1887Q2 5.24 | 1899Q3 4.32 | 1911Q4 4.31 |
| 1875Q2 4.80 | 1887Q3 6.49 | 1899Q4 5.50 | 1912Q1 3.95 |
| 1875Q3 5.05 | 1887Q4 6.04 | 1900Q1 4.74 | 1912Q2 4.11 |
| 1875Q4 6.44 | 1888Q1 5.22 | 1900Q2 3.88 | 1912Q3 5.03 |
| 1876Q1 5.72 | 1888Q2 4.82 | 1900Q3 4.19 | 1912Q4 5.88 |
| 1876Q2 5.10 | 1888Q3 4.57 | 1900Q4 4.73 | 1913Q1 5.16 |
| 1876Q3 4.05 | 1888Q4 4.93 | 1901Q1 3.82 | 1913Q2 5.58 |
| 1876Q4 5.66 | 1889Q1 4.47 | 1901Q2 3.96 | 1913Q3 5.95 |
| 1877Q1 4.83 | 1889Q2 4.01 | 1901Q3 4.58 | 1913Q4 5.64 |
| 1877Q2 4.15 | 1889Q3 4.95 | 1901Q4 4.17 | 1914Q1 4.07 |
| 1877Q3 5.39 | 1889Q4 6.03 | 1902Q1 4.28 | 1914Q2 3.83 |
| 1877Q4 6.35 | 1890Q1 5.29 | 1902Q2 4.48 | 1914Q3 5.83 |
| 1878Q1 5.43 | 1890Q2 5.06 | 1902Q3 5.02 | 1914Q4 5.43 |

Table 22—Continued

Source: Frederick R. Macaulay, Some Theoretical Problems Suggested by the Movements of Interest Rates, Bond Yields, and Stock Prices in the United States since 1856 (New York: National Bureau of Economic Research, 1938) A 144-56.

Notes: CV (1866-1878) = 0.2804
CV (1879-1914) = 0.2138
MAPC (1866-1878) = 1.145
MAPC (1879-1914) = 0.673
MNPC (1866-1878) = 0.041
MNPC (1879-1914) = 0.017

Table 23
Commercial Paper Rate of Interest at New York City, 1919-1932 (an average of observed rates, by quarter)

| Quarter Rate | Quarter Rate | Quarter Rate | Quarter Rate |
|--------------|--------------|--------------|--------------|
| 1919Q1 5.29 | 1922Q3 4.13 | 1926Q1 4.34 | 1929Q3 6.13 |
| 1919Q2 5.34 | 1922Q4 4.67 | 1926Q2 4.13 | 1929Q4 5.67 |
| 1919Q3 5.38 | 1923Q1 4.75 | 1926Q3 4.34 | 1930Q1 4.63 |
| 1919Q4 5.46 | 1923Q2 5.13 | 1926Q4 4.54 | 1930Q2 3.71 |
| 1920Q1 6.42 | 1923Q3 5.21 | 1927Q1 4.17 | 1930Q3 3.08 |
| 1920Q2 7.80 | 1923Q4 5.17 | 1927Q2 4.17 | 1930Q4 2.92 |
| 1920Q3 8.13 | 1924Q1 4.88 | 1927Q3 4.08 | 1931Q1 2.67 |
| 1920Q4 8.09 | 1924Q2 4.42 | 1927Q4 4.00 | 1931Q2 2.21 |
| 1921Q1 7.71 | 1924Q3 3.29 | 1928Q1 4.04 | 1931Q3 2.00 |
| 1921Q2 7.09 | 1924Q4 3.34 | 1928Q2 4.54 | 1931Q4 3.67 |
| 1921Q3 6.17 | 1925Q1 3.75 | 1928Q3 5.38 | 1932Q1 3.80 |
| 1921Q4 5.50 | 1925Q2 3.92 | 1928Q4 5.42 | 1932Q2 3.13 |
| 1922Q1 4.88 | 1925Q3 4.04 | 1929Q1 5.59 | 1932Q3 2.29 |
| 1922Q2 4.42 | 1925Q4 4.38 | 1929Q2 6.00 | 1932Q4 1.71 |

Source: Board of Governors of the Federal Reserve System, Banking and Monetary Statistics, 1914-1941 (Washington, D.C.: Government Printing Office, 1943) 449-51.

Notes: CV = 0.3071
MAPC = 0.405
MNPC = 0.065

Table 24
Commercial Paper Rate of Interest at New York City, 1959–1989 (an average of observed rates, by quarter)

| Quarter Rate | Quarter Rate | Quarter Rate | Quarter Rate |
|--------------|--------------|--------------|--------------|
| 1959Q1 3.30 | 1966Q4 6.00 | 1974Q3 11.53 | 1982Q2 13.48 |
| 1959Q2 3.60 | 1967Q1 5.45 | 1974Q4 9.05 | 1982Q3 11.55 |
| 1959Q3 4.19 | 1967Q2 4.72 | 1975Q1 6.56 | 1982Q4 8.81 |
| 1959Q4 4.76 | 1967Q3 4.97 | 1975Q2 5.92 | 1983Q1 8.34 |
| 1960Q1 4.69 | 1967Q4 5.30 | 1975Q3 6.67 | 1983Q2 8.61 |
| 1960Q2 4.07 | 1968Q1 5.58 | 1975Q4 6.12 | 1983Q3 9.44 |
| 1960Q3 3.37 | 1968Q2 6.08 | 1976Q1 5.29 | 1983Q4 9.19 |
| 1960Q4 3.27 | 1968Q3 5.96 | 1976Q2 5.57 | 1984Q1 9.45 |
| 1961Q1 3.01 | 1968Q4 5.96 | 1976Q3 5.53 | 1984Q2 10.77 |
| 1961Q2 2.86 | 1969Q1 6.66 | 1976Q4 4.99 | 1984Q3 11.15 |
| 1961Q3 2.90 | 1969Q2 7.54 | 1977Q1 4.81 | 1984Q4 9.26 |
| 1961Q4 3.06 | 1969Q3 8.49 | 1977Q2 5.24 | 1985Q1 8.69 |
| 1962Q1 3.24 | 1969Q4 8.62 | 1977Q3 5.81 | 1985Q2 7.91 |
| 1962Q2 3.20 | 1970Q1 8.55 | 1977Q4 6.59 | 1985Q3 7.72 |
| 1962Q3 3.33 | 1970Q2 8.17 | 1978Q1 6.80 | 1985Q4 7.70 |
| 1962Q4 3.26 | 1970Q3 7.84 | 1978Q2 7.20 | 1986Q1 7.41 |
| 1963Q1 3.31 | 1970Q4 6.29 | 1978Q3 8.08 | 1986Q2 6.54 |
| 1963Q2 3.32 | 1971Q1 4.59 | 1978Q4 9.90 | 1986Q3 5.89 |
| 1963Q3 3.70 | 1971Q2 5.04 | 1979Q1 10.10 | 1986Q4 5.73 |
| 1963Q4 3.91 | 1971Q3 5.74 | 1979Q2 9.85 | 1987Q1 5.95 |
| 1964Q1 3.95 | 1971Q4 5.07 | 1979Q3 10.60 | 1987Q2 6.85 |
| 1964Q2 3.93 | 1972Q1 4.06 | 1979Q4 13.10 | 1987Q3 7.03 |
| 1964Q3 3.91 | 1972Q2 4.58 | 1980Q1 14.25 | 1987Q4 7.54 |
| 1964Q4 4.06 | 1972Q3 4.93 | 1980Q2 10.75 | 1988Q1 6.71 |
| 1965Q1 4.30 | 1972Q4 5.33 | 1980Q3 9.65 | 1988Q2 7.25 |
| 1965Q2 4.38 | 1973Q1 6.30 | 1980Q4 14.51 | 1988Q3 8.16 |
| 1965Q3 4.38 | 1973Q2 7.47 | 1981Q1 14.52 | 1988Q4 8.59 |
| 1965Q4 4.47 | 1973Q3 9.87 | 1981Q2 15.35 | 1989Q1 9.45 |
| 1966Q1 4.97 | 1973Q4 8.98 | 1981Q3 16.21 | 1989Q2 9.29 |
| 1966Q2 5.43 | 1974Q1 8.30 | 1981Q4 12.94 | 1989Q3 8.39 |
| 1966Q3 5.79 | 1974Q2 10.46 | 1982Q1 13.70 | 1989Q4 8.06 |

Source: Various issues of the Survey of Current Business.

Notes: CV = 0.4264
MAPC = 0.686
MNPC = 0.019

Table 25
Index of Common Stock Prices, 1835–1860 (1853 = 100)

| Year | Index | Year | Index | Year | Index |
|------|-------|------|-------|------|-------|
| 1835 | 109.7 | 1844 | 84.2 | 1853 | 100.0 |
| 1836 | 97.7 | 1845 | 87.9 | 1854 | 85.2 |
| 1837 | 80.5 | 1846 | 86.1 | 1855 | 74.3 |
| 1838 | 74.4 | 1847 | 89.4 | 1856 | 69.9 |
| 1839 | 73.5 | 1848 | 80.8 | 1857 | 59.4 |
| 1840 | 67.4 | 1849 | 81.4 | 1858 | 55.0 |
| 1841 | 64.3 | 1850 | 84.9 | 1859 | 50.0 |
| 1842 | 49.0 | 1851 | 92.4 | 1860 | 59.6 |
| 1843 | 55.6 | 1852 | 98.7 | | |

Source: Walter B. Smith and Arthur H. Cole, Fluctuations in American Business, 1790–1860, 1935, 183–84.

Notes: Composed entirely of railroad stocks, which were the most important stocks of the time.

$$\begin{aligned}
 CV \text{ (1835–1849)} &= 0.1916 \\
 CV \text{ (1850–1860)} &= 0.2270 \\
 MAPC \text{ (1835–1849)} &= 11.398 \\
 MAPC \text{ (1850–1860)} &= 9.591 \\
 MNPC \text{ (1835–1849)} &= 0.844 \\
 MNPC \text{ (1850–1860)} &= 2.233
 \end{aligned}$$

In terms of industrial production, free banking exhibits strong growth, being exceeded only by the era of chartered banking, which preceded it. Of course, the early years of the Fed—including as they do the onset of the Great Depression³⁴—show a net decline in industrial production.

A Tentative Judgment

Overall, what picture of free banking is painted by the data presented in this section? One sees that money supply fluctuations were often large in the short run but showed little secular trend over the long run. This pattern was repeated for interest rates. Regarding both consumer prices and wholesale prices, free banking was among the top three periods by every measure. Stock prices during the heyday of free banking were only modestly stable, however. In relative

Table 26
Index of Common Stock Prices, 1866–1878 (1900 = 100)

| Year | Index | Year | Index | Year | Index |
|------|-------|------|-------|------|-------|
| 1866 | 58.28 | 1871 | 76.57 | 1876 | 64.44 |
| 1867 | 59.20 | 1872 | 80.66 | 1877 | 49.55 |
| 1868 | 66.63 | 1873 | 77.00 | 1878 | 53.68 |
| 1869 | 72.48 | 1874 | 72.69 | | |
| 1870 | 73.50 | 1875 | 70.67 | | |

Source: Frederick R. Macaulay, Some Theoretical Problems Suggested by the Movements of Interest Rates, Bond Yields, and Stock Prices in the United States since 1856 (New York: National Bureau of Economic Research, 1938) A 144–47.

Notes: Composed entirely of railroad stocks, which were the most important stocks of the time.

$$\begin{aligned} CV &= 0.1379 \\ MAPC &= 7.251 \\ MNPC &= 0.222 \end{aligned}$$

terms, free banking was accompanied by little growth in real national income but substantial growth in industrial production.

One might think about two benchmarks: the classical gold standard (1879–1914) and the modern Fed (1959–1989). The former is often lauded as a period of considerable stability and prosperity. The latter should—if the apologists for central banking are correct—possess all the virtues that have so often been alleged to have been absent from free banking. Free banking exhibited greater long-run stability of the money supply, interest rates, and stock prices than either the classical gold standard or the modern Fed. The variability of (1) consumer prices (both short- and long-run) and (2) wholesale prices (long-run) was less under free banking than during the years 1959–1989. Also, the growth rate of industrial production exceeded that of either the classical gold standard or the modern Fed.

One must be cautious in drawing conclusions from the data presented here. First of all, much of those data have been resurrected from the rather distant past and, as such, their reliability is open to question. However, as a partial counterpoint, it may be noted that the results for the money supply under free banking remain robust for three different estimates of that series. Second, the American experiment with free banking was *not* a pure test of the application of laissez-faire principles to banking. Be that as it may, and assuming the data

Table 27
Standard & Poor's Index of Common Stock Prices, 1879-1932 (1941-1943 = 100)

| Year | Index | Year | Index | Year | Index |
|------|-------|------|-------|------|-------|
| 1879 | 41.2 | 1896 | 42.3 | 1913 | 85.1 |
| 1880 | 52.1 | 1897 | 44.5 | 1914 | 80.8 |
| 1881 | 62.5 | 1898 | 50.5 | 1919 | 87.8 |
| 1882 | 59.0 | 1899 | 62.9 | 1920 | 79.8 |
| 1883 | 56.3 | 1900 | 61.5 | 1921 | 68.6 |
| 1884 | 47.4 | 1901 | 78.4 | 1922 | 84.1 |
| 1885 | 46.0 | 1902 | 84.2 | 1923 | 85.7 |
| 1886 | 53.6 | 1903 | 72.1 | 1924 | 90.5 |
| 1887 | 55.3 | 1904 | 70.5 | 1925 | 111.5 |
| 1888 | 52.0 | 1905 | 89.9 | 1926 | 125.9 |
| 1889 | 53.2 | 1906 | 96.4 | 1927 | 153.4 |
| 1890 | 52.7 | 1907 | 78.4 | 1928 | 199.5 |
| 1891 | 50.3 | 1908 | 77.8 | 1929 | 260.2 |
| 1892 | 55.5 | 1909 | 97.1 | 1930 | 210.3 |
| 1893 | 47.8 | 1910 | 93.5 | 1931 | 136.6 |
| 1894 | 43.9 | 1911 | 92.4 | 1932 | 69.3 |
| 1895 | 45.3 | 1912 | 95.3 | | |

Source: Historical Statistics of the United States, 1975, Series X 492-98.

Notes: The war years 1915-1918 are excluded.

$$\begin{aligned}
 CV \text{ (1879-1914)} &= 0.2769 \\
 CV \text{ (1919-1932)} &= 0.4568 \\
 MAPC \text{ (1879-1914)} &= 10.020 \\
 MAPC \text{ (1919-1932)} &= 21.167 \\
 MNPC \text{ (1879-1914)} &= 2.709 \\
 MNPC \text{ (1919-1932)} &= 1.685
 \end{aligned}$$

are reasonably accurate, it appears that American free banking was indeed consistent with a significant degree of (particularly long-run) macroeconomic stability, contrary to popular belief.

The impression has been assiduously cultivated by the opponents of a banking currency that the early American banks issued a volume of circulating notes enormously in excess of the legitimate demands of business. This impression is absolutely unfounded and the proof is afforded by the figures. (Conant 1927, 394)

CONCLUSION

Neither the Scottish nor the American episode of free banking was a case of true laissez-faire banking. They were only approximations to the model. The

Table 28
Standard & Poor's Index of Common Stock Prices, 1959–1989 (1941–1943 = 100)

| Year | Index | Year | Index |
|------|--------|------|--------|
| 1959 | 573.8 | 1975 | 861.6 |
| 1960 | 558.5 | 1976 | 1020.1 |
| 1961 | 662.7 | 1977 | 982.0 |
| 1962 | 623.8 | 1978 | 960.2 |
| 1963 | 698.7 | 1979 | 1030.1 |
| 1964 | 813.7 | 1980 | 1187.8 |
| 1965 | 881.7 | 1981 | 1280.4 |
| 1966 | 852.6 | 1982 | 1197.1 |
| 1967 | 919.3 | 1983 | 1604.1 |
| 1968 | 987.0 | 1984 | 1604.6 |
| 1969 | 978.4 | 1985 | 1868.4 |
| 1970 | 832.2 | 1986 | 2363.4 |
| 1971 | 982.9 | 1987 | 2868.3 |
| 1972 | 1092.0 | 1988 | 2657.9 |
| 1973 | 1074.3 | 1989 | 3228.4 |
| 1974 | 828.4 | | |

Sources: Historical Statistics of the United States, 1975, Series X 492-98.
 Various issues of the Survey of Current Business.

Notes: CV = 0.5468
 MAPC = 11.480
 MNPC = 6.683

various shortcomings of and restrictions upon Scottish free banking were enumerated in Chapter 5. As for the United States, there were few interest rate controls, impositions of unlimited liability, prohibitions of small-denomination notes, or specially privileged banks. However, the American free banks labored under two key restrictions that were absent from the Scottish system: (1) They were required to hold state bonds as security for their note issues, and (2) they were subject to severe limitations on both intrastate and interstate branching. These restrictions had potentially adverse effects on both the assets and liabilities of banks.

The bond security requirement forced a connection between banks' issuance of notes (their chief liability) and the holding of state bonds. Although the "ostensible aim of the restriction was to reduce the noteholders' exposure to losses, its actual impact may well have been the reverse" (White 1986, 892). This seemingly paradoxical result stemmed from the following: (1) Allowing free banks to buy state bonds at market value and then to issue notes based on the face value of those bonds encouraged some degree of fraud, a possibility discussed earlier in this chapter; (2) the bond security requirement forced free

Table 29
Real National Income per Capita, 1839–1932 (in 1860 prices)

| Year | Income | Percent Change |
|-----------|----------|----------------|
| 1839–1840 | \$101.45 | ----- |
| 1849–1850 | 119.02 | +17.3 |
| 1859–1860 | 136.45 | +14.6 |
| 1869 | 107.65 | -21.1 |
| 1879 | 151.72 | +40.9 |
| 1889 | 198.88 | +31.1 |
| 1897–1901 | 238.33 | +19.8 |
| 1907–1911 | 283.30 | +18.9 |
| 1919 | 308.53 | + 8.9 |
| 1929 | 476.18 | +54.3 |
| 1932 | 336.78 | -29.3 |

Sources: National Bureau of Economic Research, Trends in the American Economy in the Nineteenth Century (Princeton: Princeton University Press, 1960) 360. Historical Statistics of the United States, 1975, Series F 6-8, F 250-261.

Notes: Nominal income was adjusted using the price indexes from Table 17.

Average Annual Percentage Change:

(1839–1849) = +1.61
 (1849–1859) = +1.37
 (1859–1879) = +0.53
 (1869–1879) = +3.49
 (1879–1907/1911) = +2.10
 (1919–1932) = +0.68

banks to be exposed unnecessarily to the risk of falling state bond prices; that is, it caused them to hold suboptimal asset portfolios; and (3) since free banks could only issue notes in proportion to their existing bond holdings, in the short run, they sometimes could not deal with a currency run by merely issuing more notes—they might have to pay out specie in order to satisfy consumer demand for cash (White 1986, 892–94). This last item is a particularly important violation of the model in Chapters 2 and 3. In that model, an advantage of free banking over central banking was the capacity of individual banks to issue notes on short notice so as to keep currency runs from becoming redemption runs. In practice, the bond restriction significantly reduced such a theoretical advantage.

Table 30
Real National Income per Capita, 1959–1989 (in 1967 prices)

| Year | Income | Percent Change |
|------|---------|----------------|
| 1959 | \$2,363 | ----- |
| 1969 | 3,595 | +52.1 |
| 1979 | 3,713 | + 3.3 |
| 1989 | 5,065 | +36.4 |

Sources: Various issues of the Survey of Current Business. Statistical Abstract of the United States, 1990, 7.

Notes: Nominal income was adjusted using the price indexes from Table 18.

Average annual percentage change
 (1959–1989) = +2.57

Donald Wells and Leslie Scruggs point out the very real practical benefit that accrues to banks and their customers when banks are granted the legal right to issue notes. Oddly enough, the event they cite is the liquidity crisis of the winter of 1914–1915 (1986a, 907–8). Banks were at that time permitted to issue currency under the provisions of the Aldrich-Vreeland Act of 1908 (amended in 1913 and 1914). The result was that “currency was issued in exchange for deposits when the public demanded it, and was extinguished when demand subsided. Banks were able to conserve their gold certificates and greenbacks as reserves by paying out the bank notes for use as hand-to-hand currency . . . the Aldrich-Vreeland Act worked far better than the Fed did in the early 1930s” (Wells and Scruggs 1986a, 908).

The other major distorting restriction on American free banks was the widespread prohibition on establishing branch offices. White explains that restrictions on branching not only prevent banks from holding properly diversified asset portfolios, but they also affect banks’ liabilities. This follows from the fact that “a branched bank is less susceptible to random withdrawals or even runs by depositors in any area because it has a broad source of deposits (it can rely on the law of large numbers) and can transfer reserves from surplus to deficit branches. A unit bank rests on a narrower and less stable base” (White 1986, 895–96).³⁵ Stephen Williamson concurs: “The unit banking restriction results in a banking system in which banks are less diversified than they would be otherwise. These banks are therefore more sensitive to idiosyncratic shocks, and they experience runs and fail with higher probability” (1989, 22).

The negative impact of branching restrictions may be seen by comparing the American and Canadian systems. Canadian banks in the period 1870 to 1913

Table 31
Index of Industrial Output per Capita, 1829–1932 (1899 = 100)

| Year(s) | Index | Percent Change |
|-----------|-------|----------------|
| 1829–1839 | 11.4* | ----- |
| 1839–1849 | 18.1* | + 58.8 |
| 1849–1859 | 27.6* | + 52.5 |
| 1866 | 43.0 | + 55.8 |
| 1879 | 54.7 | + 27.2 |
| 1914 | 144.2 | +163.6 |
| 1919 | 163.2 | + 13.2 |
| 1929 | 229.7 | + 40.7 |
| 1932 | 121.6 | - 47.1 |

Sources: Historical Statistics of the United States, 1975, Series A 6-8. Edward Ames, "Trends, Cycles, and Stagnation in U.S. Manufacturing since 1860" (Oxford Economic Papers, Vol. XI, No. 3, October 1959) 272. W. W. Rostow, The Process of Economic Growth (London: Oxford University Press, 1960) 350.

Notes: *Represents the annual average for the period.

Average Annual Percentage Change:

$$\begin{aligned}
 (1829/39-1839/49) &= +4.73 \\
 (1839/49-1849/59) &= +4.31 \\
 (1866-1879) &= +1.87 \\
 (1879-1914) &= +2.81 \\
 (1919-1932) &= -2.24
 \end{aligned}$$

were subject to no branching restrictions (Williamson 1989, 23). American banks of the same period (the National Banking System era) could rarely establish branch offices. The numbers of failures in the two systems were dramatically different. "Canada had 23 bank liquidations while, at the same time, the United States had 3,208" (Williamson 1989, 24). Furthermore, it is well known that between 1921 and 1933, a time of continuing limitations on branching, almost 15,000 American banks failed. In stark contrast, "between 1923 and 1985, *no Canadian banks failed*" (emphasis added) (Williamson 1989, 24). Wells and Scruggs summarize the costs of antibranching statutes very well when they note that to limit banks' ability to branch is to encourage the formation of banks that are small, inefficient, poorly diversified, undercapitalized, and unstable (1986a, 900).

Table 32
Index of Industrial Output per Capita, 1959–1989 (1987 = 100)

| Year | Index | Percent Change |
|------|--------|----------------|
| 1959 | 51.26 | ----- |
| 1969 | 76.75 | +49.73 |
| 1979 | 92.89 | +21.03 |
| 1989 | 105.99 | +14.10 |

Sources: Various issues of the Survey of Current Business. Statistical Abstract of the United States, 1990, 7.

Note: Average annual percentage change (1959–1989) = +2.45

It is obvious from the above that American free banks were burdened with important restrictions and, thus, did not constitute a pure laissez-faire banking system. One begins to marvel at how relatively well free banking in the United States did perform in the context of such constraints.

NOTES

1. The beginning of the period dates from Michigan's adoption of the first free-banking statute in 1837. The end of the era is usually identified with the passage of the National Currency Act of 1863.
2. Insofar as free banking is concerned, this statement must be discounted somewhat. The reason is that, although Ohio and Indiana did adopt free banking in the early 1850s, Missouri never enacted a free banking law (Rockoff 1975, 3).
3. This was the year New York first allowed free banking.
4. Hepburn suggests that this term originated because the notoriously unsound banks in Michigan often used "a dog in red color and the wild cat" as decorative devices on their notes (1903, 138).
5. These bonds usually had to be deposited with the state auditor.
6. The precise figures are 47.8 percent (339) failed and 30.7 percent (104) of those did not redeem their notes at par. That is, 14.7 percent of the total banks failed below par.
7. That is if one defines inflation in the conventional way as a rise in the price level. It is perhaps preferable to define inflation as an excess supply of money.
8. In New York, there were fifty-five free banks that lasted fifteen years or more.
9. Capital gains and losses would be shared with noteholders if banknotes were, for example, mutual fund shares rather than debt instruments.
10. Despite this apparent benefit, it should not be forgotten that the bond requirement seriously compromised the safety of U.S. free banks by imposing on them an inade-

quately diversified asset portfolio. The health of free banks was, to a considerable extent, tied to the degree of fiscal responsibility exhibited by the various state legislatures.

11. Of course, there are economists—even Nobel prize winners—who reject the idea that free markets are efficient. The author is not among them. This writer perceives free markets as both just and efficient, though not perhaps in the Pareto-optimal sense.

12. It is clear that Rockoff is thinking in terms of the conventional “perfect competition” model in which there are a large number of firms, there is ease of entry and exit, and the long-run expected rate of economic profit is zero.

13. See *Historical Statistics of the United States*, 1975, Series E 135–66.

14. See the *Economic Report of the President*, 1991.

15. This is not to deny that banks need to be adequately capitalized. However, given that option clauses were not used in the United States and free banks were required by law to redeem in specie on demand, it seems clear that the more crucial factor was adequate primary reserves.

16. This was Michigan, which repealed its free-banking law in 1839, but reintroduced free banking in 1857.

17. This is one reason why one might argue that “free banking” lasted from the late 1830s until the Civil War. The problem with that is that the necessity of a charter must have curtailed the flexibility of the currency supply, as well as distorting it in the direction of politically favored persons. Given that both transportation and communication were somewhat primitive and the states prohibited branching, an adequate supply of notes required a large number of banks. This obviously would not be true today.

18. One suspects that these data are based on book values rather than market values, but the source gives no indication. The difference could be large and therefore quite important.

19. See Chapter 8.

20. The effect of the antibranching statutes will be discussed later in this chapter.

21. Nothing said here is meant to disparage microeconomics. Indeed, the author would argue that a macroeconomics that is not firmly rooted in microprinciples is no economics at all.

22. The author reasons within a monetarist/Austrian context in which monetary instability has both nominal and real effects. See Chapter 3.

23. See Christina Romer (1986a).

24. This represents the interval between (1) the demise of the second Bank of the United States as the government’s fiscal agent (and embryonic central bank) and (2) the proliferation of free banking in the 1850s.

25. The United States did not, of course, enter the war formally until April of 1917, but the American economy was disrupted long before then. See Benjamin Anderson (1979, 25–43).

26. Symbolically, these are:

$$CV = \frac{\sqrt{\sum_{t=1}^n (X_t - \bar{X})^2}}{\frac{n}{\bar{X}}}$$

$$MAPC = \frac{\sum_{t=1}^n |(X_t - X_{t-1})/X_{t-1}|}{n}$$

except for interest rates, where

$$\text{MAPC} = \frac{\sum_{t=1}^n |(X_t - X_{t-1})|}{n}$$

$$\text{MNPC} = \left| \frac{\sum_{t=1}^n [(X_t - X_{t-1})/X_{t-1}]}{n} \right|$$

except for interest rates, where

$$\text{MNPC} = \left| \frac{\sum_{t=1}^n (X_t - X_{t-1})}{n} \right|$$

27. One could make the argument that wars *should* be included because they are made possible (or more likely) by changes in the institutional structure. That is, wars may be—at least in part—the product of the particular monetary regime. For example, the Civil War prompted the rejection of free banking, and World War I brought on the abandonment of the classical gold standard.

28. Very few free banks seem to have been established in Massachusetts and Pennsylvania, however.

29. See *Historical Statistics of the United States*, 1975, Series A 6–8, A 195–209, and Rockoff (1975, 3). Based on a linear interpolation of census figures, in 1853 13,888,700 (54.0 percent) of the 25,736,000 residents lived under free banking.

30. New York's rivals were Boston and Philadelphia.

31. Total figures are available from the author upon request.

32. Such data extends into the eighteenth century (Smith and Cole 1935).

33. See Kevin Dowd (1992, 3), for example.

34. Some economists seem to think of the depression as some sort of “natural disaster.” Given that very strange premise, they argue that the depression years should not be included in any series on the basis of which comparative economic judgments are to be made. That is nonsense. The Federal Reserve clearly played a large role in the precipitation of the depression and should be called to task for it.

35. A “unit bank” is one that has no branch offices.

Chapter 7

OTHER APPROACHES

All influential economic theories surely pass through four stages. Initially, the new idea is treated with skepticism, perhaps even with scorn. It strikes many theorists as being outlandish or irrelevant. A few, however, think they perceive something of value. They are challenged and excited by the prospect of exploring new territory. Thus the second stage is born. A variety of researchers begin to investigate, interpret, and modify the idea. It becomes, in short, a viable research topic. Such research leads to either the conclusion that the idea is irremediably defective and must be discarded, or the refinement of the idea and its eventual acceptance into the received canon of the discipline.¹ Finally, a theory that has survived and gained acceptance will find expression in some institutional structure or policy.

The theory of free banking has advanced well into stage two. A growing number of economists are energetically exploring its characteristics. Moreover, a variety of approaches to (or models of) free banking have emerged. This is healthy and natural, but it does breed controversy. The purpose of this chapter is to review several of the alternative approaches to free banking.

BASIC DIFFERENCES

There have been developed, as the author sees it, three basic models of free banking. Within each general approach, variations can be found. Therefore, the reader must not infer that every individual named below necessarily advocates precisely those attributes that are listed for each respective basic model.²

The issues regarding which the differentiation has occurred seem to be (1) direct convertibility versus either indirect convertibility or inconvertibility, (2) money as a debt instrument versus money as an equity instrument, (3) whether

or not the medium of exchange (MOE) should also be the medium of account (MOA) or the medium of redemption (MOR),³ (4) a stable price-level rule versus a productivity norm, (5) whether or not the holding of reserves is relevant to the performance of free banks, and (6) if reserves are important, whether or not the reserve ratio should be 100 percent.

The White-Selgin Model

As has been made abundantly clear, this model is the focus of the present book. It has been formalized, extended, and slightly modified by the author, but it is essentially the White-Selgin (WS) model whose virtues have been extolled throughout this work. The WS model concerns a commodity-backed currency that is directly convertible into that commodity. The media of exchange, for example, private banknotes, are denominated in the unit of account, for example, dollars. The medium of account (gold) is also the medium of redemption. Inside moneys—notes or deposit credits issued by private banks—are liabilities of the issuing banks. The holding of a reserve of outside money is essential for meeting redemption demands by customers as well as for settling adverse clearing balances with other banks. However, it is argued that both withdrawals and deposits are randomly distributed in a mature free-banking system. Therefore, fractional reserves are adequate to meet all plausible conditions. This would be reinforced by the likely presence of option clauses. Finally, the price level would be stable, except when there occur pervasive changes in per-capita productivity. The price level would fall when such productivity rose, and rise when such productivity fell.

The advantages of the WS model over the alternatives are said to be quite significant. First of all, it is the one model of free banking that is most like banking as it exists now. It would strike most consumers as the least alien of the free-banking proposals.⁴ Related to that point is the fact that *all* the historical experiments with free banking looked more or less like the WS model. Inside money redeemable in specie was issued by private banks, which held fractional reserves. The other major advantage is that it adheres to the productivity norm rather than a stable price-level rule. As such, it is less likely to suffer business cycles.⁵

The Rothbard-Mises Model

For presentations of the Rothbard-Mises model (RM), one should see Murray Rothbard (1983, 87–124; 1984b; 1985; 1992) or Ludwig von Mises (1966, 441–48; 1971, 395–99). Other economists who adopt the RM model include Joseph Salerno, Hans-Hermann Hoppe, Mark Skousen, and Gary North (Rothbard 1992, 99).

This approach is very similar to the WS model in several respects. It proposes that banks issue inside money directly convertible into gold coin on de-

mand (but without delay; i.e., option clauses would be illegal). Banknotes would be bank liabilities, the MOE, MOR, and MOA would be the same, and the price level would be inversely related to aggregate production. The most dramatic difference between the RM and WS models is that in the former, banks would be required by law to hold 100 percent reserves at all times. This would, of course, force banks to operate like modern consumer finance companies rather than like conventional commercial banks. Loans could be made only out of the bank's capital instead of out of deposits. Both the supply of credit and the profits of banks would clearly be sharply reduced.

The justification given for this constraint on banking activity is the assertion that fractional reserves are inherently fraudulent.

It should be clear that modern fractional reserve banking is a shell game, a Ponzi scheme, a fraud in which fake warehouse receipts are issued and circulate as equivalent to the cash supposedly represented by the receipts . . . fractional reserve banking is at one and the same time fraudulent and inflationary; it generates an increase in the money supply by issuing fake warehouse receipts for money. . . . Commercial banks—that is, fractional reserve banks—create money out of thin air. Essentially they do it in the same way as counterfeiters. (Rothbard 1983, 97–98)

Rothbard adopts this position because he insists that banknotes and deposit credits are (or should be) warehouse receipts, both legally and economically. That is, he perceives the proper role of banks to be that of a warehouse rather than a financial intermediary. The act of depositing funds in a commercial bank and receiving in return either banknotes or a deposit credit is not, to Rothbard, a credit transaction. The depositor is not loaning his or her funds to the banker, but merely hiring the banker's vault as a place of safekeeping for valuable assets. Rothbard declares that depositing money in a bank should be perfectly analogous to storing one's furniture in a warehouse (1983, 88–89). In other words, the banker should be dealt with as a *bailee* rather than as a *debtor* (Rothbard 1992, 98fn). It is crucial to realize at this point that in the RM model, a change in inside money demand does not reflect a change in consumer time preferences (a change in the rate of saving), and it will not bring about a change in the supply of credit. This stands in sharp contrast to the WS model as it was presented in Chapter 3.

The bank run plays a special role according to Rothbard. Unlike the overwhelming majority of economists, he views bank runs favorably. They function as a constraint on inflationary monetary expansion under free banking (1983, 112). They also "instruct the public in the essential fraudulence of fractional reserve banking" (1983, 113). Rothbard seems literally to believe that if one observes a period during which there occur very few bank failures, then this is sure to be a time of inflationary monetary expansion. A case in point is that of Scottish free banking (1765–1845). In discussing Lawrence White's work on Scotland, Rothbard contends that a low rate of bank failure "might indeed

mean that the *banks* are doing better, but at the expense of society and the economy faring *worse*. Bank failures are a healthy weapon by which the market keeps bank credit inflation in check . . . a lower rate of bank failure can scarcely be accepted as any sort of evidence for the superiority of a banking system" (emphasis in original) (1988b, 230).

Those who embrace the RM model⁶ seem always possessed of an intense, almost obsessive concern with monetary expansion. The author is *not* here implying that inflationary expansions should be of no concern to monetary theorists. Far from it. Such phenomena have very grave, often disastrous, consequences. It is just that those who advocate the RM model seem to "throw the baby out with the bath water" in their quest for limitations on such expansions. They also, as a result, give rather too little attention to unjustified contractions.⁷

The sources of this focus on expansionary bank policies include the proposition that precious metal coins (or bullion) are the only "true" money, a concomitant suspicion regarding banknotes, and an unusual view of what constitutes the optimal supply of money.⁸ The core proposition of the RM model is that money, correctly understood, is a commodity such as gold or silver and that the names of the various monetary units (dollar, pound, peso, etc.) "invariably originated as names for units of weight of a money commodity" (Rothbard, 1984b, 9). According to such a perspective, the "dollar" is—or should be—analogous to common units of measure, such as the liter, the meter, and the kilogram. That is, the dollar should be defined—once and for all—as a specific fraction of an ounce of gold. Moreover, Rothbard argues that that was once the standard textbook approach (1984b, 10). Reasoning on the basis of that perspective, Rothbard defines inflation as any increase in inside money that is not matched by an equal increase in specie (1984b, 16).

If only specie is "money," banknotes are not money, but merely money substitutes. How do they come to be used as a medium of exchange, then? Mises explains this via his "regression theorem" (1971, 97–123). This analysis concludes that all present moneys must have originated as some highly marketable commodity that initially had a significant nonmonetary use. "Money cannot originate as a new fiat name, either by government edict or by some form of social compact" (Rothbard 1984b, 10). However, this does *not* mean "that fiat money, once established on the ruins of gold, cannot then continue indefinitely on its own" (Rothbard 1984b, 11). Banknotes, whether convertible or inconvertible, whether produced privately or by the state, are all derivations from the one true money—gold.⁹

Mises suggests that private banknotes not only tend to be dangerously inflationary, but also may not be necessary. He favorably quotes Thomas Tooke's claim that "free trade in banking is free trade in swindling" and comments on that "state of affairs under which everybody is free to issue banknotes and to cheat the public ad libitum" (1966, 446). His curious position is that banks should be allowed to issue notes in order that consumers' use of banknotes will diminish, if not disappear altogether. Mises does not deny the obvious conve-

nience offered by paper banknotes vis-à-vis precious metal coins. Nevertheless, he declares that “banknotes are not indispensable. All the economic achievements of capitalism would have been accomplished if they had never existed” (1966, 447).

The third reason for the RM focus upon monetary expansion is an idiosyncratic definition of the “optimal supply of money.” Some have argued that the optimal supply occurs when the rate of deflation is such that the nominal rate of interest is zero (Friedman 1969). Others might suggest that any supply is optimal that equals the demand for money at the existing price level.

Rothbard, on the other hand, declares that the optimal supply is that minimum necessary to establish the money commodity as the accepted medium of exchange (1988a, 180). Any increase in the money stock in excess of that minimum will exhibit zero “social” marginal utility. In fact, such an increase will do only harm. “There is never any social benefit to increasing the quantity of money. . . . Monetary calculations and contracts are distorted, and the early recipients of the new money, as well as debtors, gain income and wealth at the expense of later recipients and of creditors” (Rothbard 1988a, 180). Furthermore, it is unnecessary to increase the money supply to match an increase in money demand brought about by population growth. All that will occur then is that prices will fall so as to raise each dollar’s purchasing power (Rothbard 1983, 47). In other words, Rothbard assumes that, although the nominal money stock is constant, real money balances will rise because of perfectly flexible prices (1983, 34–41).¹⁰

Two final features of the RM model are the absence of option clauses and the implication that the price level will be inversely related to the level of production. Considering the model’s view of outside money as specie and inside money as redeemable in specie (for which redemption purpose, 100 percent reserves are maintained), it may not be surprising that option clauses become superfluous. In the RM model, they are neither permissible nor useful. The defining characteristic of (inside) money is “whether a certain claim is withdrawable instantly *on demand*” (emphasis in original) (Rothbard 1983, 255), and there will be “no provision for emergency suspensions of redeemability” (Rothbard 1983, 263).

Rothbard states that “changes in prices in general . . . are determined by changes in the supply of and demand for money . . . an increased supply of goods will, *other things being equal*, increase the demand for money and therefore tend to lower prices” (emphasis in original) (1975, 15). That is, Rothbard’s concern seems to be with aggregate production. One should note that this differs from the WS concern with changes in per-capita productivity that lower goods’ unit production costs.¹¹

Problems with the RM Model

In general, one may say that the RM model is, as the saying goes, an “ingenious solution to a nonexistent problem.” If free banking on a specie stan-

dard but with fractional reserves (WS) were chaotic and inflationary, then the RM approach might deserve serious consideration. However, Chapters 2, 3, and 4 have argued—one would hope persuasively—that the WS model is non-inflationary, responsive to consumer preferences, consistent with microeconomic principles, and resistant to business cycles. The RM model is clearly inferior.

The best that can be said for the RM model is that in the long run, it is noninflationary. It does not, for example, allow for any ready response to consumer demand. If the income velocity of money falls (rises), the money supply will not increase (decrease) to match the increase (decrease) in money demand. In the absence of perfectly flexible prices in all markets, departures from the natural rate of unemployment would ensue. Furthermore, the market rate of interest might depart from the natural rate. Assume the velocity of money falls (the Cambridge k rises). That is, assume consumer time preferences shift toward greater saving (higher money balances). The increase in saving drives the natural rate of interest lower.¹² However, the money supply is fixed in the short run. No new loans or deposits will be created. The market rate of interest will exceed the natural rate.¹³ A recession or depression will be the result; notional demand will exceed effective demand; Say's Law will be violated.

It would appear that the RM model tries to sever that link between the market for money and the market for time, which is crucial to the success of the WS model, as was examined in Chapter 3. This follows from Rothbard's view of money balance decisions as distinct from decisions regarding saving versus consumption.

[A consumer] allocates between the various categories on the basis of two embracing utilities: *his time preferences* decide his allocation between consumption and investment (between spending on present vs. future consumption); *his utility of money* decides how much he will keep in his cash balance. In order to *invest* resources in the future, he must restrict his consumption and *save* funds . . . saving and investment are always equivalent. . . . The demand for money is completely unrelated to the time-preference proportions people might adopt. (emphasis in original) (Rothbard 1975, 40)

For Rothbard, there are three separate allocative channels for one's income: consumption, cash balances, and savings-investment (these two are always equal). As suggested above, this reasoning leads to a model in which discoordination can arise between the money and credit markets, and it raises a troublesome question. How can one deny that to refrain from consumption expenditures in order to increase one's money balances is to engage in voluntary saving? Yet this is what Rothbard apparently does deny.

Paradoxically, the RM model does not honor consumer preferences. Choices as to reserve ratios, redemption contracts, and the nature of the base money surely should be left to the unconstrained¹⁴ interaction between banks and their customers if one claims to be proposing a truly free market approach to bank-

ing.¹⁵ The RM model declares that to have a nonfraudulent banking system, one *must* have a specie base, 100 percent reserves, and immediate redemption upon demand. It is furthermore important to realize that much of Rothbard's argument on behalf of such a system is legalistic rather than economic in nature.

The British Court decisions cited and criticized by Rothbard, to the effect that bank notes do not contractually bind their issuers to holding 100 percent reserves, seem eminently reasonable given the inscription actually found on the face of a typical British bank note. . . . There is no promise made about reserve-holding behavior. There is nothing to indicate that the note constitutes a warehouse receipt or establishes a bailment contract. . . . Nothing in a free banking system prevents an individual who desires 100 percent reserve banking from explicitly contracting for it. . . . Fractional reserves do not constitute breach of contract. (White 1985, 120–21)

Rothbard might be well advised in this case to heed his own statement to the effect that “[free market action] is optimal, not from the standpoint of the personal ethical views of an economist, but from the standpoint of the free, voluntary actions of all participants and in satisfying the freely expressed needs of the consumers” (1970, 887).

Finally, the RM model may imply a waste of resources as well as being unnecessarily restrictive insofar as economic growth is concerned. Many have argued that 100 percent specie reserves require an inordinate use of real resources. Of course, if the RM model led to monetary equilibrium and the avoidance of business cycles, the benefits might justify the expenditure, but it does not. The supply of money is entirely too inflexible to maintain monetary equilibrium. Indeed, the RM structure reminds one somewhat of the National Banking System in which notes were issued in strict proportion to bank holdings of government bonds. That rigidity made it impossible for banks to respond appropriately to seasonal fluctuations in the demand for currency. The result was a series of financial crises (Sprague 1910).

Also, what of economic growth? If the RM model were implemented, then the long-run growth in money and credit would mirror changes in the stock of monetary gold. Averaged over a considerable span of time, the rate of change in that gold stock might approximate the rate of change in the demand for money, but that will not suffice. First of all, monetary equilibrium cannot be maintained or business cycles avoided, if the money supply is incapable of rising or falling in response to short-run conditions. RM theorists usually keep in mind the need for macroconclusions to rest on a bedrock of microprinciples. What they tend to forget is that long-run results are merely a summation of short-run actions.

Second, economic growth will not be sustained without parallel growth in both money and credit (in the aggregate if not per capita). Yet this basic insight is rejected by the RM model. “The notion of ‘normal’ credit expansion is

absurd. Issuance of additional fiduciary media, no matter what its quantity may be, always sets in motion those changes in the price structure the description of which is the task of the theory of the trade cycle" (Mises 1966, 442fn). The RM model does not aim for monetary equilibrium or achieve it.

The Black-Fama-Hall Model

As W. William Woolsey and Leland B. Yeager (1991, 2) explain, the Black-Fama-Hall (BFH) system is so named to "acknowledge ideas borrowed, altered, and recombined from writings of Fischer Black, Eugene Fama, and Robert Hall." Leland Yeager has been one of the principal exponents of this approach, along with his long-time collaborator Robert Greenfield and, more recently, W. William Woolsey (Greenfield and Yeager 1983; Yeager 1985; Yeager 1986; Yeager and Greenfield 1989; Woolsey and Yeager 1991). Two other well-known proponents of a laissez-faire approach to banking—David Glasner (1989) and Kevin Dowd (1989)—embrace significant aspects of the model. One might also point out that Friedrich Hayek's seminal work on free banking (1978) anticipates certain features of the BFH approach.

In the BFH model (because of his extensive work in this area, one is tempted to call it the Yeager model, but here the conventional terminology will be retained), distinctive inside moneys are issued by private banks. These are either indirectly convertible into some outside asset(s) or are inconvertible. The holding of reserves is largely irrelevant to bank success (Woolsey and Yeager 1991, 8). The MOE is not the same as the MOA. The MOR may be different from both the MOA and the MOE. These inside moneys might be either equity instruments in the form of checkable mutual fund shares, or debt instruments in the form of notes, coins, or demand deposits. An early misunderstanding arose in this regard as a result of the statement that "the BFH system would indeed lack money as we now know it" (Greenfield and Yeager 1983, 303). What would be lacking would be *base money* as we now know it. That is, the government "would be forbidden to issue money" (Yeager 1985, 104). It is, however, fair to say that early work on the BFH system tended to concentrate on the model as one of an advanced and sophisticated payments system in which most, if not all, transactions were accomplished via checks or electronic transfers.

More recently, BFH theorists have granted the importance of hand-to-hand currency. Yeager allows that "some institutions would presumably issue notes and even coins denominated in the BFH unit" (1985, 104). Indeed, under a BFH structure, "apart from crucial differences in the unit and in the media for redeeming their obligations, financial institutions would be practicing something similar to free banking under a gold standard" (Yeager 1985, 105).

The differences between the BFH and WS models ought not to be minimized. The differences Yeager refers to are certainly crucial. Paramount among them is the fact that in the BFH approach, the "unit of account would no

longer coincide with the unit of the medium of exchange. . . . The government would define the new unit . . . in terms of a bundle of commodities so comprehensive as to have a nearly stable value against goods and services in general" (Yeager 1985, 104). This "value unit," in which all prices would be stated, would consist of the market values of specific quantities of specific widely traded commodities. For example, 1 unit might equal the market values of 5 ounces of commodity A plus 9 square feet of commodity B plus 6 gallons of commodity C. This would remain the definition of the value unit forever.¹⁶

Arbitrage would alter the relative prices of those individual commodities that comprise the bundle, so that the bundle's value would always equal 1 unit. Media of exchange would take whatever form was found to be mutually acceptable to both banks and their customers. However, these exchange media would all be denominated in the one common unit of account. Redemption could be made by using *any* asset, the quantity of which possessed a market value equal to the required number of standard units (or commodity bundles). It would be unlikely that consumers would actually seek redemption in terms of the components of the standard bundle, since most of those would be substances of no use to the typical consumer. More likely would be indirect convertibility in terms of some familiar asset, such as gold.

Kevin Dowd and David Glasner adopt somewhat different positions regarding the issue of a stable unit of account. Although not objecting to the idea of a commodity bundle, Dowd suggests that the definition of the MOA be revised periodically. This he justifies on the grounds that "a commodity index that seemed ideal *ex ante* might turn out to be less satisfactory than it was anticipated to be. Furthermore, there is always the possibility that certain goods might cease to exist at all" (1989, 99). Glasner, on the other hand, is concerned that a stable price level may lead to sharp fluctuations in employment. Therefore, he opts for stabilizing an index of wages. "A dollar would always be convertible into the amount of purchasing power that would buy a stipulated amount of labor power . . . a labor standard would imply a gently falling output-price level and very low nominal interest rates" (Glasner 1989, 240). It is obvious that Glasner's position bears some strong similarities to George Selgin's espousal of a "productivity norm," "neutral money" policy.

The advantages claimed for the BFH system are truly impressive (Greenfield and Yeager 1983). It would provide a stable unit in which prices would be quoted. This would foster more reliable economic calculation, reduce uncertainty in credit markets, and encourage long-term contracts. Since inflation would be a thing of the past, implicit taxation by means of monetary expansion would be avoided. Fiscal restraint would be increased. Competition in financial services would both stimulate innovations and curb the waste of resources brought on by attempts to escape regulatory restrictions. Bank panics would be unknown. Since there would exist no outside money that was held as a reserve asset by banks, then there would also exist no redemption runs. An increased demand for currency by consumers would not bring about a multiplicative de-

crease in the total money supply. Banks would be "run-proof." Also, "since media of exchange would bear interest or dividends at competitive rates," the optimal quantity of money—as defined by Milton Friedman (1969)—would be held (Yeager 1985, 105).¹⁷ Finally, "monetary disequilibrium as we have known it could no longer occur . . . painful macroeconomic disorders would be practically forestalled" (Yeager 1985, 105). The supply of money would automatically adjust to the demand for money. Effective demand would tend always to equal notional demand.

Before discussing problems with the BFH, it might be helpful to digress briefly and mention those premises that inspire the model. First of all, BFH advocates think it "absurd" for the value of the unit of account (e.g., the purchasing power of the dollar) to depend on the supply of and demand for the medium of exchange. They seek a stable unit of account. Second, they insist that monetary equilibrium has proven so elusive because money has no market, and no single price, of its own.¹⁸ Money trades against all other goods and services. As a result, a change in either money supply or money demand may not be reflected in the value of the unit of account. Prices are pervasively "sticky," and therefore, monetary disequilibrium may persist for long periods because its elimination requires changes in a multitude of specific prices. Finally, the persistence of monetary disequilibrium brings about major macroeconomic disruptions that inflict substantial suffering on the populace. The only viable solution seems (to the proponents of BFH) to be a system that stabilizes purchasing power by separating the MOA from the MOE. This stability is in part dependent upon the fact that the components of the MOA are distinctly nonmonetary in nature, whereas the MOE may take the traditional forms of checks, banknotes, and coins.

Problems with the BFH Model

Despite the care and elegance with which the BFH model has been developed, there remain serious questions about its desirability. Some of these have been addressed—with at least some success—by defenders of BFH. Others have not been adequately dealt with at all.

One of the early criticisms of the BFH system was that it must suffer from the well-known inefficiencies of barter because of (1) the abolition of base money and (2) the separation of the unit of account from the medium of exchange (O'Driscoll 1986; White 1984c). Allegedly, however, the BFH is not really barter. There is, indeed, a separation of the sort described. However, this does not imply that "people would be making and receiving payments, awkwardly, in miscellaneous commodities and securities with fluctuating values that would have to be transferred into numbers of Units on each occasion. Instead, people would be using coins, banknotes, and checking accounts furnished by banks and denominated in Units" (Yeager and Greenfield 1989, 414).

Closely related to the above is the suggestion that the BFH model must be

defective, because it violates the evolutionary process by which money came into being in the first place (Menger 1892). The historical origin of money as the single most marketable commodity in society has, to many, implied the corollary proposition that there will be no separation of the unit of account from the medium of exchange.

[A] unit of account emerges wedded to a general medium of exchange. Prices are universally posted in the characteristic units of a medium or set of media that sellers are routinely prepared to accept in exchange. This process is self-reinforcing: a buyer or seller who communicated bid or ask offers in nonstandard units would impose calculation costs on potential trading partners. For this reason the unit of account remains wedded to the medium of exchange. (White 1984c, 711)

Greenfield and Yeager point out that all existing monetary systems are the products of legislation and regulation to a large extent (1983, 303). Some major nonevolutionary, legislative change will be required if a laissez-faire system is to come into existence. Therefore, they see nothing contradictory about constructing an “ideal” system—even though nothing like it has ever actually existed.

The defenders of the BFH model are obviously correct when they bring one's attention to the constructivist nature of present monetary systems, and there is no *a priori* reason to deride any idea merely because it is unusual. However, the critics of BFH have a point. It has become a commonplace to observe that the study of monetary economics is (or should be) eminently *practical*. As ingenious as the BFH system may be, is it consistent with consumers' revealed (or demonstrated)¹⁹ preference? Furthermore, considering the widespread confusion about and criticisms of BFH on the part of professional economists, are the advocates of such a system likely ever to convince either lawmakers or voters/consumers of its supposed virtues? One must answer both questions in the negative.²⁰

Bennett McCallum (1985) offers two criticisms of the BFH model. He first suggests that it is really only a version of the old idea of a composite-commodity standard. The composite-commodity standard retains a base money in units of which inside money is denominated. Price stability is supposedly attained by anchoring the base money to a basket of commodities via redemption in terms of those commodities. However, the BFH system claims to do away with base money altogether. Moreover, the BFH commodity bundle would only “define the unit of account, and define it independently of any particular medium of exchange” (Yeager and Greenfield 1989, 417).

Some still question whether the redemption unit might not itself become base money²¹ (Meltzer 1989, 427). One might also wonder whether the system will, as Yeager and Greenfield assume, converge on a single unit of account (Meltzer 1989, 426–27). There would be no legal barrier to competitive units of account, but convergence is assumed in BFH because “government would exert

a nudge against the inertia of old practices by conducting its own transactions and accounting in the new unit" (Yeager 1985, 104). Is there not a danger inherent in letting government define the unit of account, even if it is legally applicable only to the government's own records? Furthermore, how is this necessarily consistent with consumer preferences? How can the advocates of BFH be so sure that either consumers or bankers *want* an MOA that is neither the MOE nor the MOR?

McCallum also asserts that the price level would be indeterminate in a BFH system. Yeager and Greenfield reply that it "would provide determinacy by defining the unit of account with a commodity bundle. . . . This definition would be made operational by indirect convertibility" (1989, 417). The issue of indirect convertibility has proven controversial. Several writers have claimed that it "would cause severe monetary instability" (Woolsey and Yeager 1991, 1). The "paradox" of indirect convertibility asserts that extreme inflations and deflations will occur as a result of redemption in a medium different from the medium of account.

Assume the commodity bundle (MOA) is initially worth one noninflated dollar and the redemption medium (MOR) is gold. Imagine that an inflating bank's notes have fallen in market value to \$.90 per dollar of face value. An arbitrageur then buys a depreciated dollar, using \$.90 issued by a noninflationary bank. He turns around and presents the \$1.00 to the inflating bank and demands redemption. If the bank redeems the note with \$1.00 worth of gold, then the arbitrageur may buy \$1.11 face value of depreciated notes. These he may redeem for \$1.11 worth of gold and buy \$1.23 face value of depreciated notes, and so forth. The system quickly collapses.²²

There is, however, a flaw in such a scenario, which Woolsey and Yeager quite persuasively explain. "The paradox occurs, we emphasize . . . only if the bank calculates the amount of gold required in redemptions not at a genuine market price but at the very 'price' of gold implied by its own redemptions. Hence, the paradox is easily avoided" (1991, 11). One may—and should—have other reservations about the BFH model, but indirect convertibility does not seem to lead to the severe instability that has been hypothesized.

Last, but not least, one may point out that the basic objective of the BFH model—a money that possesses stable purchasing power—has been shown to be a suboptimal goal (*see* Chapter 4). The details of the argument will not be repeated here. However, the principal proposition was that a stable price-level policy would—in the face of pervasive productivity shocks—lead to departures of effective demand from notional demand, that is, to business cycles.

SUMMARY

The three basic models of free banking—WS, RM, and BFH—have been reviewed and compared. Their similarities and differences were noted in terms of (1) convertibility, (2) reserve holdings, (3) whether or not the MOA, MOE,

and MOR were the same, (4) media of exchange as debt versus equity, and (5) a stable price level versus a productivity norm. Although all three are interesting attempts to apply laissez-faire principles to money and banking, only one (WS) seems superior on all counts. The WS model avoids both the confusing complications of the BFH approach and the reserve-holding rigidity of the RM. It is both simple and efficient. It also remains consistent with Say's Law under all circumstances. Moreover, the WS model is the least alien form of free banking that has yet been proposed. If free banking is ever again to be a reality, the overwhelming probability is that it will be instituted along the lines of the White-Selgin model.

NOTES

1. This process does not necessarily proceed along perfectly rational lines, nor is it always unaffected by the political and ethical beliefs of the researchers involved. A case in point might be the "Keynesian revolution" of the late 1930s.
2. Some may even disagree with the segmentation into three models.
3. "The MOE refers to the debt instruments which are transferred in the exchange process, the MOA refers to the commodities in terms of units of which prices are quoted" (Dowd 1989, 84). The unit of account means the unit used in stating prices. The MOR is that asset used by banks to redeem inside money. For example, in the United States, under the classical gold standard, the gold-backed paper dollar was the MOE, gold was both the MOA and the MOR, and the dollar was the unit of account. The MOA, MOR, and MOE were really indivisible or coextensive.
4. Practically speaking, this could prove to be overwhelmingly important. From a political standpoint, free banking (in any of its guises) is going to be a difficult idea to "sell" to the public. Furthermore, to dwell on the fact that the hostility toward free markets in banking is largely due to the economic ignorance of the populace and/or propagandistic pronouncements by various public agencies is not very helpful. The "strangeness" of free banking needs to be minimized if free banking is to become a reality.
5. See Chapters 3 and 4.
6. All who embrace the RM model are Austrian economists, but not all Austrians adopt the RM approach.
7. It is in regard to this that the monetarists have presented a somewhat more robust exposition (Horwitz 1990, 17–20).
8. Of course, an important additional source is the Mises-Hayek (or Austrian) trade cycle theory, which identifies monetary and credit expansions as the root cause of most, if not all cycles.
9. Actually, Rothbard has proposed a "parallel standard" in which both gold and silver would be used and there would be freely fluctuating exchange rates between the two forms of base money (1984b, 8). This should be distinguished from historical bimetallism, in which the gold/silver exchange rate was set by law. Under bimetallism if, for example, the demand for gold rose relative to the demand for silver, then the market price of gold in terms of silver would exceed the official price. Gold would be officially *undervalued*, and silver officially *overvalued*. Gold coins would disappear from circulation, but silver coins would remain in circulation. This is the phenomenon with which

Gresham's Law deals. It is an application of the theory of price controls to the realm of money.

10. Rothbard seems never to make explicit his assumption of price flexibility, but more or less perfectly flexible prices are clearly what he has in mind.

11. See Chapters 2 and 3.

12. Of course, at this point, Rothbard would reject the scenario, since he does not take an increase in money demand to represent increased saving.

13. This is literally the defining characteristic of a recession that is used by Austrians, such as Rothbard (Mises 1971, 346–66; Rothbard 1975, 12–25).

14. Here "unconstrained" is taken to signify a market context in which only acts of force or fraud are outlawed.

15. Please note that the WS model does *not impose* gold-backed inside money with fractional reserves on the society. It merely argues that both history and logic suggest that such are likely to be the characteristics of future free banking.

16. Both Glasner and Dowd suggest departures from this. See later discussion.

17. This seems to presuppose that all inside money would be equity-based.

18. This writer would suggest that the monetary disequilibria of recent decades is the product of the institutional structure (central banking) rather than the inescapable result of something inherent in money itself. That is, price "stickiness" (as well as price "rigidity") may be largely the product of decades of discretionary monetary policy. Thinking in terms of price indexes instead of specific prices also may help foster the belief that the market for money is "just a figure of speech, not a reality" (Yeager 1985, 104).

19. The distinction is made by Rothbard (1977), for example.

20. It will be difficult enough to convince the average consumer of the benefits to be gained from free banking generally. It will be enormously more difficult to persuade consumers that they should (1) redeem the media of exchange in assets, such as gold or "investment-grade securities," but denominate their accounts in units of "standard commodity bundles" (Yeager and Greenfield 1989, 413).

21. In fact, it is likely that, if gold is used as the MOR, the system will soon evolve into one of direct convertibility. There is a wealth of logical and historical evidence that suggests that a single commodity will dominate a basket of commodities. It would be ironic indeed if the BFH model were tried and it transmuted into the WS model.

22. The process works in the opposite direction, too. However, the effects are "asymmetrical because there is a limit, namely zero, to how low reserves of the redemption medium can fall but no definite limit to how high they can rise" (Woolsey and Yeager 1991, 4).

Chapter 8

CRITICISMS

The body of conventional literature on monetary matters has, for many years, included several propositions that explicitly challenge the viability and/or desirability of free banking. Chapters 2, 3, and 4 presented a detailed theoretical case *for* free banking on the grounds that it would maintain nominal national income, reflect consumer preferences in the time and money markets, keep the market rate of interest equal to the natural rate, achieve continuous monetary equilibrium, and avoid business cycles. Despite those arguments, in order to complete the discussion, one must address the standard criticisms. That is, one must examine the key points in the case *against* free banking. The issues so often raised in opposition to private money and laissez-faire banking include the following claims: (1) that money is a “public good” and thus cannot be profitably produced in a free market; (2) that there exist significant “external effects” such that private money balances would be suboptimal; (3) that money production is a natural monopoly, that is, that marginal and average costs decline over the relevant range of output; (4) that competition in money will lead to massive inflation; (5) that free banking is inefficient in that it represents a waste of resources; (6) that privately produced moneys suffer from serious counterfeiting problems; (7) that central banking arose in response to true consumer needs, that is, that it is central banking rather than free banking that represents the natural evolution of money markets; and (8) that a lender of last resort (a central bank) is necessary in order to prevent or mitigate financial crises.

MONEY AS A PUBLIC GOOD

The precise meaning of “public good” (sometimes called “collective good”) is still the subject of controversy.¹ No doubt, the most common interpretation

of the concept is that any good that possesses both “nonrivalrousness” and “nonexcludability” is a public good. Nonrivalrousness means “that a given quantity of a public good can be enjoyed by more than one consumer without decreasing the amounts enjoyed by rival consumers” (Hyman 1987, 114). Nonexcludability “implies that it is too costly to develop a means of excluding those who refuse to pay from enjoying the benefit of a given quantity of a public good” (Hyman 1987, 115). If something is a public good, the implication is that “free riders” will exist, that is, that some people will be able to benefit from the good without having to bear the cost of its acquisition. If money is a public good, then free banking may be decidedly inferior to central banking.

First of all, one must realize that, despite the pervasive use of the term both within and without the economics profession, the concept of public goods may be questionable. At the most fundamental level, one may ask: Where is the “public,” the “collective,” which demands the good in question? “Only an individual exists . . . there is no existential referent of the ‘collective’ that supposedly wants and then receives goods” (Rothbard 1970, 884).² Two of the most frequently cited examples of public goods—national defense and police protection—are problematic. Murray Rothbard brings up a thorny problem that besets these two. He points out that neither can really be “collectively” demanded, since pacifists do not want national defense and criminals do not want police protection (1970, 884). Some would, of course, reply that these groups, especially the pacifists, represent small minorities within society; the vast majority may have intense desires for defensive agencies. Be that as it may, one cannot conclude that there is an unambiguous “collective” demand. To do so is to indulge in the fallacious technique of making interpersonal comparisons of utility.

Rothbard furthermore questions the notion of public goods as having an indivisible supply, from the benefits of which no one can be excluded. “[N]ational defense’ is surely not an absolute good with only one unit of supply. It consists of specific resources committed in certain definite and concrete ways. . . . A ring of defense bases around New York, for example, cuts down the amount possibly available around San Francisco” (1970, 885).

An additional facet of the issue should be mentioned. The whole discussion of public goods, external effects, and free riders presupposes knowledge of the “optimal” production level for the good in question. This cannot be known outside the artificial world of a perfectly competitive general equilibrium. Moreover, any inefficiencies that do arise may be the result of the failure (not of the market, but of the legal authorities) to either define or enforce property rights (Cordato 1992, 16–23).

For the sake of argument, one may grant that public goods exist. Some economists conclude that money is a public good, because “any one agent, holding cash balances of a given average size, is less likely to incur the costs of temporarily running out of cash, the larger are the average balances of those

with whom he trades" (Laidler 1977, 321fn). If that were sufficient to establish money as a public good, however, would not *all* goods be public goods? Surely, the greater the stocks held by bookstores, for example, the less likely every purchaser of books is to "run out of books." Does that mean that books are public goods? Obviously not. David Laidler, among others, simply overlooks the essential question regarding public goods: Can person A benefit from a particular quantity of good X possessed by person B, even when B might prefer that A not receive that benefit? Regarding money, the answer is no.

[A] particular sum of inside money renders its service—increased purchasing opportunities—only to those who actually possess it. Those who refuse to do without other forms of wealth or who do not abstain from consumption (by holding inside money instead of consuming a flow of services from goods) cannot take advantage of the benefits associated with inside money. (Selgin 1988a, 154)

In short, since only the owner of any given sum of money can benefit from its liquidity services, then money is neither nonrivalrous nor nonexcludable (Vaubel 1986, 934). Thus, it cannot be a public good on those grounds.

Others perceive money as a public good, because the various specific moneys serve as units of account—the dollar, the pound-sterling, the yen, and so forth. That is, the unit of account is also the unit of the medium of exchange. The argument here is that using a particular unit of account creates a positive externality by way of conveying valuable information that all may use. "Uniformity in quoting prices, maintaining accounts, and stating forward contracts has the same virtues as uniform standards for switching and transmitting telephone calls" (Hall 1984, 306), but this does not constitute a serious challenge to free banking of the sort (WS) modeled and defended in this book. At best, all it demonstrates is that "government should suggest a unit of account and publish a price index for it, but not that it should supply money" (Vaubel 1986, 935).

One might say that quoting prices in, and transacting with, a single money eliminates some formidable accounting and transaction costs. . . . But just to avoid the inconvenience of multiple monetary units, money does not have to be supplied monopolistically. If many suppliers of money were making their moneys convertible into the same asset, all the moneys would be exchangeable at a one-for-one rate. The benefits of a single monetary unit could be secured without monopoly. (Glasner 1989, 28)

It must be admitted that the unit of account argument would be germane in the context of a proposal such as Friedrich Hayek's (1978). There banks issued their own distinctive banknotes, and each bank might use a different unit of account. This is yet another reason why a Hayekian system is unlikely to exist (see Chapter 1). A single unit of account is superior to a multiplicity of such units. Throughout this study, free banking has implied multiple currencies all

convertible into the same commodity and all denominated in the same unit of account.

Karl Brunner and Allan Meltzer (1971) offer a variation on this theme when they argue that money is itself a substitute for information because it (potentially) reduces transaction costs. Since information is presumed to be a public good, then money must be, too. This argument fails also. It is clear that "to show that X is a substitute for a public good is not sufficient to prove that X is a public good . . . what has to be shown is not that money is a substitute for information but that it provides the public good of information" (Vaubel 1986, 935).

Even if money does, however, provide information (or knowledge), a problem remains: Is economic knowledge a public good?³ Superficially, it appears to be, since it seems nonrivalrous and nonexcludable. Nevertheless, it is not. The common supposition that all "true" knowledge, that is, correct factual statements, must be a public good arises from a strong positivistic turn of mind. That is to say, whosoever argues that economic knowledge is public in nature forgets that what is important (economically, at least) is *not* if the data are "correct" or not, but in what manner they are perceived to be useful by some specified economic agent. How else is it possible for two different market participants with identical endowments to examine the same price data series (for some commodity such as copper, say) and yet reach opposite conclusions (one buys copper; one sells copper)?

Gerald O'Driscoll and Mario Rizzo argue similarly that economic knowledge is fundamentally subjective in nature. What is perceived as "knowledge" depends upon the circumstances, values, and goals of the perceiver (1985, 35–50). As they suggest, there can be no such thing as public knowledge—all useful economic knowledge is *private* by its very nature.

SUBOPTIMAL MONEY BALANCES

Related to the public good argument is the oft-repeated assertion that a free market in money will lead to suboptimal money holdings by the public.⁴ This has been most forcefully proposed by Milton Friedman (1969, 16–48). Friedman argues that optimal real money balances will be held only if it is true that the marginal nonpecuniary yield from money ($MNPS_m$) is equal to the nominal rate of return on interest-bearing assets (r_b), with that rate equal to zero. That is, optimality follows from $MNPS_m = r_b = 0$ (Friedman 1969, 36). If $MNPS_m = r_b > 0$, then suboptimal money balances result. Friedman's concern stems from his contention that the marginal *private* cost of increasing one's cash balances (assumed equal to the rate of return on nonmoney assets) will be greater than the marginal *social* cost of producing greater money balances (assumed equal to zero). It is clear that Friedman further assumes a fiat currency rather than a commodity-backed currency. He offers two solutions: (1) a fully anticipated, steady rate of price-level deflation that provides a pecuniary yield

on money balances or (2) the payment of explicit interest on money balances. Both are intended to offset the difference between private and social marginal costs.

There are problems with Friedman's analysis. First of all, the private cost of acquiring money is not the forgone interest that one would have gained from some alternative financial asset. The cost of acquiring money (its price) is the goods and services one forgoes. That is—as Friedman himself elsewhere declares (1972, 201)—the price of money is its purchasing power in terms of real goods (see Chapter 2). It is the cost of *holding* money that is correctly identified as the forgone interest income from alternative assets (Selgin 1988a, 52–53). Indeed, to forgo income from interest-bearing assets is the cost of *holding* any non-interest-bearing asset, but most assets are ‘never used directly to acquire goods and services. Money is the intermediary; the cost of acquiring money is measured in real goods or services.

Also, one might question whether the concept of marginal “social” cost is even meaningful. Friedman assumes that his use of the concept is noncontroversial and, furthermore, that such costs are objective and quantifiable. Others disagree. Steven Cheung argues that most applications of the concept have been inappropriate because of either invalid specifications of the constraints involved or incorrect observations of events (1980, 51). He further suggests that the frequent misuse of “social cost” has “hindered the advancement of economics as a behavioral science” (1980, 51). James Buchanan reminds one that “cost is subjective; it exists only in the mind of the decision-maker or chooser . . . the opportunity cost involved in choice cannot be observed and objectified” (Buchanan and Thirlby 1981, 15). Stephen Littlechild insists that “social cost and production are not objective concepts” (1978, 88). O'Driscoll and Rizzo reinforce this position: “Cost, just like utility, is defined over projected want satisfaction and not directly over the commodities themselves. . . . Commodities are only way-stations to the ultimate satisfaction of basic wants” (1985, 47). As long as social cost is neither objective nor quantifiable, Friedman's optimum quantity of money rule remains questionable.

Kevin Dowd—himself an advocate of a stable price-level rule—makes two interesting comments on Friedman's analysis. First of all, he estimates “the welfare loss under a zero-inflation regime implied by an inability to pay interest on currency holdings” (1991e, 7). This he finds to range from .00007 percent to slightly over 0.1 percent of 1991 Gross Domestic Product (GDP) for the United Kingdom (1991e, 9). Since this might be taken as a measure of the potential gain from achieving optimal money balances, it appears that such gains are trivially small. Second, Friedman seems to have realized how relatively small the gains would be, for “his own results did not persuade him to abandon the goal of price stability for the further benefits of optimal deflation” (Dowd 1991c, 12).⁵ The argument for optimal money balances cannot be very compelling when its own advocate opts for a different approach.

Furthermore, it is interesting to notice that Friedman's analysis—by his own

admission—is based in part on the existence of “perfect capital markets” as that term is used in the pioneering work of Franco Modigliani and Merton Miller (Friedman 1969, 35fn). Modigliani and Miller (MM) assume that (1) all transactions are costless, (2) debt is riskless, (3) capital markets are perfectly competitive, (4) all individuals and firms are able to borrow and lend at the same rate of interest, and (5) all firms can be sorted by risk class, with all the firms in each class exhibiting identical return distributions (1958). From these assumptions, MM conclude that in the absence of taxes, “the market value of any firm is independent of its capital structure” (1958, 268). In other words, the method of firm financing is irrelevant. If corporate taxes exist (as they do) and firms are allowed to deduct interest payments on debt as expenses, then MM propose that firm value is maximized at the point of 100 percent debt financing.

Does this proposition accurately predict actual firm behavior? Charles Haley and Lawrence Schall point out that “firms do not increase debt to the upper limit possible even though interest is tax-deductible” (1979, 290). The flaw may lie in the extremely artificial assumptions of the MM model. In reality, transactions are not costless, capital markets are not perfectly competitive (information is not costless and extranormal profits can be made), not everyone can borrow and lend at the same interest rate, and firms cannot readily be sorted into risk classes (Haley and Schall, 1979, 289–90). This is unstable ground upon which Friedman builds his argument.

Finally, George Selgin, without questioning the concept of “social cost,” offers a reply to Friedman. He points out that under free banking, competition would, of course, compel the payment of interest on deposits.⁶ However, interest payments on banknotes might indeed prove impossible because of high transaction costs. Therefore, “there would be a *suboptimal* quantity of banknotes, but the loss from this would be partly offset by a *supraoptimal* quantity of deposits. The only *net* loss would be that stemming from any inelasticity of substitution between deposits and notes” (emphasis in original) (Selgin 1988a, 156).⁷ Selgin goes on to ask whether government intervention might perform better. He thinks not. A central bank “is less likely to attempt interest payments on currency than private note issuers, since its monopoly privilege places it under less pressure to do so” (1988a, 156). In short, free banking would come closer to an “optimal quantity” of money than would central banking.⁸

BANKING AS A NATURAL MONOPOLY

A standard proposition of modern microeconomic theory is that if there exist significant economies of scale, that is, if long-run average costs decline over the range of output demanded in the market, then only one firm will survive. Such a firm would be a “natural monopoly.” It has often been argued that banking may be a natural monopoly, and if so, the most efficient approach is to restrict competition and allow only a single issuer of banknotes, the central

bank. In short, if there are large cost economies in banking, then free banking may not be an optimal solution.

The most basic rebuttal to the natural monopoly argument is to point out that costs cannot be known to the producer (much less to the economist) prior to the process of production and a firm's costs are likely to change when the market structure changes. From this it follows that

a governmental producer of money is not an efficient natural monopolist unless he can prevail in conditions of free entry. . . . The only operational proof that a common money is more efficient than currency competition and that the government is the most efficient provider of the common money would be to permit free currency competition. (Vaubel 1986, 933, 935)

That is, free banking is the necessary precondition for discovering whether or not banking is a natural monopoly. In the absence of such competition, those who claim that banking is a natural monopoly are guilty of making an unsupportable assertion.

Are there any logical reasons for expecting economies of scale in banking? There are two: economies of scale in reserve holding and economies of scale resulting from diversification (Dowd 1991b). The first is based on the widely accepted principle that reserves change with the square root of a bank's liabilities. This suggests that the optimal reserve ratio will decline as the bank expands, which further suggests that the bank's average costs will fall. However, these economies are extremely small. Citing David Glasner, Dowd states that "a bank with only \$10,000 of liabilities would exhaust 99 percent of the possible savings in holding reserves" (1991b, 4). Furthermore, this estimate may *exaggerate* the benefits if reserves are interest-bearing or small banks can pool their reserves instead of merging (Dowd 1991b, 4). A second source of scale economies could be asset diversification. A large bank might experience lower average transaction and delegation costs because of its large and well-diversified portfolio of assets. Once again, however, these gains appear far too small to lead to natural monopoly (Dowd 1991b, 7).

One approach to the natural monopoly argument is actually to estimate cost functions for commercial banks. A number of studies have tried to ascertain whether or not banking exhibits either economies of scale (cost savings resulting from a larger scale of operation) or economies of scope (cost savings resulting from producing multiple products that share common inputs). The obvious problems with all such contemporary studies are that they are not estimating costs in a free-banking environment and they base their calculations on accounting costs rather than economic costs. The ideal study would be one that estimated economic cost functions in a laissez-faire context, but since true free banking has never existed, those recent studies, although a "second-best" approach, may be helpful.

Loretta Mester explains that "early cost studies treated financial services as

a single product . . . many of these studies found that the average cost of production falls as more is produced—that is, there are economies of scale" (1987, 15–16). However, banks are not single-product firms; they offer loans, investments, deposit accounts, and currency of a sort (traveler's checks). That variety of products makes it possible for them to enjoy economies of scope as well as scale. More recent studies have often therefore modeled banks as multiproduct firms. The results have been consistently the same. *Economies of scale seem very small*, although some studies find evidence that they do exist. See George Benston, Allen Berger, Gerald Hanweck and David Humphrey (1983), Benston, Hanweck, and Humphrey (1982), Berger, Hanweck, and Humphrey (1986), Thomas Gilligan and Michael Smirlock (1984), or Gilligan, Smirlock, and William Marshall (1984). Mester concludes that "there is no evidence that larger firms have a cost advantage over smaller firms" (1987, 24).

For example, Jeffrey Clark (1984) estimates the output elasticity of cost, $(\partial C / \partial Q) (Q/C)$, for a sample of 1,205 banks using both log linear and generalized functional form cost functions. If such elasticity is significantly less than 1, one can conclude that scale economies do exist. Clark finds that the measure of this elasticity is "never below 0.95. Thus economies of scale in the banking industry appear to be small and operating efficiency is unlikely to be substantially improved by an increase in bank size" (1984, 67). To this may be added the research of David Humphrey, who similarly estimates cost elasticities for 13,000 commercial banks, grouped by asset size. Based on his results, Humphrey asserts that "there appears to be no strong reason to constrain bank mergers or inhibit nationwide banking for fear of conferring important cost advantages on large banks . . . reliance on the cost or scale economy argument is not supported by the data developed here or in other recent studies" (1987, 37).

The economies of scale that do exist seem to disappear rather quickly. After surveying nine studies of banking costs, Clark declares that the economies are gone by the time a bank has acquired \$100 million in total deposits (1988, 26). "The conclusion seems to be that increasing returns to scale exist but are limited, and it is surely significant that not a single study finds evidence that banking is a natural monopoly" (Dowd 1991b, 14). The natural monopoly argument as a critique of free banking appears to rest on a weak empirical foundation.

FREE BANKING AND INFLATION

Many economists have assumed that laissez-faire banking and inflation (perhaps even hyperinflation) are intimately bound together. In this context, one might mention Friedman (1959, 7), Boris Pesek and Thomas Saving (1968, 86–87), and Pesek (1968), among numerous others. This belief appears to be based on the premises that (1) consumers are willing to use any banknotes that are issued; that is, they are indiscriminate; (2) there are no mechanisms within

free banking that would constrain the overissue of notes; (3) the relevant marginal costs of a note-issuing bank are its marginal *production* costs (which are admittedly small, though positive, for commodity-backed paper banknotes); (4) profit-maximizing free banks would supply a quantity of notes at which marginal production cost equals marginal revenue; (5) marginal revenue in this context is measured in terms of the purchasing power of money; and (6) therefore, free banking would produce a money supply such that the purchasing power per monetary unit was quite small; that is, there would be substantial inflation.

This sounds convincing, but it is fallacious nonetheless. First of all, to propose that consumers would *voluntarily* use any currency that had depreciated in value (purchasing power) is to suppose that consumers would not act in their own self-interest.⁹ One of the fundamental tenets of economics is that individuals seek to maximize their total utility. There is no reason to assume that money is the sole exception to that principle. The only way in which an inflated currency can remain in circulation is to have its use mandated by law—to pass legal tender laws. Inflation is far more likely under central banking than under free banking for that reason.

Second, there are strong forces within a free-banking system that operate in an anti-inflationary manner. These are the processes of reflux and adverse clearings (see Chapter 2). Both serve to curtail any attempt by a bank to expand its liabilities in excess of the demand for same. Furthermore, as also discussed in Chapter 2, the key cost to a free bank is not the cost of *producing* banknotes, but the cost of maintaining them in circulation. These marginal costs are clearly positive and rising. Thus, a free bank will indeed supply a quantity such that marginal cost equals marginal revenue (purchasing power), but that does not imply inflation.

Benjamin Klein offers a compelling reason why free banks will avoid an excessive production and circulation of money: “[I]f information about future performance is costly, information is a valuable product. The brand name of a firm is then not only an identification mark but also a capital asset” (1974, 432). Furthermore, the value of such a capital asset possessed by a free bank would “be related to the anticipated *predictability* of the future price level in terms of the money” (emphasis in original) (Klein 1974, 433). For a free bank to inflate would be to destroy one of its important assets. What of its other assets? Donald Wells and Leslie Scruggs suggest that “another major factor that would prevent a bank of issue from inflating its currency would be the fact that the great majority of its assets would be denominated in its own banknotes; thus the bank of issue could be a leading victim of its own overissuance” (1983, 84).

In theory, then, one would expect free-banking regimes to exhibit no inflationary secular trends of any consequence. What of the historical evidence? If one examines the two best-known cases of multiple note issues—Scotland and the United States—one finds some ambiguity in the case of Scotland and a

clear answer for the United States. With Scotland, there is both anecdotal and circumstantial evidence of some inflation (see Chapter 5). However, the lack of data series for Scotland separate from Great Britain as a whole makes any conclusion very hazardous. As for the United States, the data exist and lead one to conclude that very little inflation occurred. Specifically, from 1850 to 1860 (the heyday of free banking), wholesale prices rose by 10.74 percent, an average of only 1.025 percent per year (see Table 17). Consumer prices rose by 7.99 percent, an average of a mere 0.772 percent per year (see Table 19). By comparison, one finds from Tables 18 and 20 that from 1959 to 1989 wholesale prices rose 252.1 percent (4.29 percent per year), and consumer prices rose by 325.3 percent (4.94 percent per year). Kevin Dowd gives a succinct summary of the historical evidence when he declares that the “claim that competition among unregulated banks would lead to an explosive money supply and rapid inflation thus has no support in the historical record, and indeed, inverts the truth that rapid inflations have always been associated with government interventions to suppress competition” (1992, 3).

FREE-BANKING INEFFICIENCY

Milton Friedman is one of the best-known proponents of yet another criticism of free banking, at least of that based on a specie standard. He asserts that such a system is horribly inefficient, because it requires the use of significant amounts of real resources in order to supply the metallic outside money (1959, 4–6; 1962, 220–21). “The use of so large a volume of resources for this purpose establishes a strong social incentive in a growing economy to find cheaper ways to provide a medium of exchange” (Friedman 1959, 5). He goes on to estimate the annual cost of a gold standard as 2.5 percent of the American national product (1959, 5).

Lawrence White responds to this criticism in two ways. First of all, he points out that Friedman makes the unjustified assumption of a “pure commodity standard,” that is, a system of banknotes backed 100 percent by gold coin (1984a, 148). That is, Friedman assumes that free banking will follow the Rothbard-Mises (RM) model (see Chapter 7), but none of the approximate free-banking experiments, for example, those in Scotland, the United States, France, Canada, and Sweden, were systems of 100 percent reserves. To make the assumption Friedman makes is to bias the case against free banking. White recalculates the cost of a laissez-faire, specie-backed system using 1982 data on M1 and GNP and reserve ratios comparable to those actually observed in Scotland (about 2 percent). He arrives at “an estimate of annual resource costs of between 0.01 and 0.03 percent of gross national product” (1984a, 148). White further opines that “this figure is insignificant in comparison with plausible estimates of the GNP losses due to monetary instability” (1984a, 149fn). Even if, instead, one uses the much higher reserve ratios for American free banks (a mean of 14.9 percent per Table 5), one still gets an estimate of roughly 0.04

to 0.1 percent of GNP per annum. Either way, Friedman's figures are badly overstated.

In addition, White is sensitive to an insight that seems to have escaped Friedman's notice altogether:

The forced substitution of fiat for convertible currency, like the Ricardian forced substitution of convertible currency for coin, is by no means efficient when it contravenes consumer preference for what is considered a more trustworthy currency. Lowering production costs does not constitute efficiency when the resulting product is one of lower quality in consumers' eyes. The actual forced movement in the twentieth century from a gold-convertible dollar to an inconvertible dollar must have represented a "negative social saving." (1984b, 296)

In other words, utility losses may occur at the microlevel even when certain (apparent) monetary gains are achieved at the macrolevel. Friedman's error lies in adopting what White has brilliantly termed a "macroinstrumental" approach as opposed to a "microsovereignty" approach (White 1985, 114–15). The former means letting the economic analyst determine what is "desirable"; the latter means letting the consumer decide.

FREE BANKING AND COUNTERFEITING

A very common belief regarding free banking has been that it is conducive to counterfeiting. Most economists would not question the assertion that, for example, during the American free-banking period, "counterfeiting was rampant" (Kemmerer and Jones 1959, 195). Counterfeiting was not unheard of in free-banking systems, but was it a severe and chronic problem? The facts seem to suggest otherwise.

"The Scottish free banking system . . . seems to have provided few opportunities for profit through fraudulent note issue. Counterfeiting was rare" (White 1984a, 140). Henry Meulen agrees that "experience has demonstrated to the Scottish people that forgeries of the paper of its private banks are rarer than counterfeit sovereigns: the issuers of the paper are on the spot, and are interested in preventing forgeries of their own notes; whereas the government acts slowly and ponderously from a distance" (1934, 69).

What about the United States? Is it not true that American free banking witnessed massive quantities of forged notes? Perhaps not. The widespread belief in the magnitude of such counterfeiting stems from a misunderstanding of the various "banknote reporters" published at the time. These were periodicals (usually weekly) that listed each free bank, the discount (if any) then prevailing on the bank's notes and any known counterfeit notes. A perusal of such banknote reporters conveys the impression of an enormous number of counterfeit notes.

Such an impression is erroneous, however. Hugh Rockoff explains that "his-

torians have not understood that the reporters listed all counterfeits and all banks which had failed, even if the notes had been removed from circulation years before. . . . In other words, the reporters contained *cumulative* indexes of bank failures and counterfeits, *not annual indexes*" (emphasis in original) (1975, 23). He mentions, for example, a banknote reporter from 1849 that still listed a bank in Savannah, Georgia that had closed ten years earlier (1975, 25–26). Robert King suggests that the unreliability of such data may make it impossible ever to construct an accurate series on American counterfeit notes (1983, 155). In short, the precise extent of counterfeiting experienced under free banking in the United States may never be known. Nevertheless, one thing appears to be true: the frequency with which counterfeiting occurred has in the past been exaggerated.

As for other episodes of free banking, one should see the detailed surveys in Dowd (1992). Generally, counterfeiting seems to have been a minor problem. In Scotland, banks sometimes even honored forged notes that were innocently offered for redemption or deposit (White 1984a, 40). In Canada, "since all banks had an interest in preventing forgeries, it was only natural that an organization like the Canadian Bankers Association (CBA) would emerge to look after this common interest" (Wells 1989, 16).

Does theory suggest that free banks ought to have a problem with counterfeit notes? No, since the likelihood of successful counterfeiting varies directly with the average period of circulation; that is, notes that return to the issuer very slowly are more likely to be forgeries. Central banking systems are inherently inferior in this regard. If there are both legal tender laws and a monopoly issuer of currency, then notes tend to circulate for long periods before they are returned to the issuer (Selgin 1988a, 149). This encourages attempts at counterfeiting. Free banks should, in contrast, have their notes returned frequently via the mechanisms of reflux and adverse clearings. Indeed, the more intense the competition, the more rapidly free banks would return their rivals' notes for redemption. As a result, the average period of circulation for free-bank notes should be quite short, and the likelihood of counterfeiting should be small (White 1984a, 140).

CENTRAL BANKING AS A SPONTANEOUS EVOLUTION

Recently the view has been expressed that competitive banking is neither a natural development from market forces nor an efficient approach to the supposedly unique problems of banking. It has been proposed instead that central banking is both superior to free banking and, moreover, the result of an evolutionary process rather than a legal imposition that constrains the market. The most vigorous expositor of this idea is probably Charles Goodhart, a former economic advisor for the Bank of England. Goodhart's argument boils down to the following propositions: (1) Centralized control of banking is necessary and desirable because of instability resulting from "contagion effects," the

impracticability of private deposit insurance, and the "moral hazard" problem; and (2) central banks came into existence as a natural reaction to the deficiencies of competition (1988, 6–11, 103–4).

Goodhart believes free banking necessarily suffers from panics that arise from "contagion effects." Yet Arthur Rolnick and Warren Weber found very little evidence of contagion in American free banking between 1841 and 1861 (1986), and one would expect even less in a true laissez-faire system. If the common elements that link commercial banks together in a central banking scheme—centralized reserves, a lender of last resort, a uniform currency, and deposit insurance—were eliminated, then each bank would have to be judged on its own merits. The liquidity or solvency of one bank would have little or no bearing on the soundness of any other bank.¹⁰ "Contagion" may be largely a product of those restrictions on the free market that comprise central banking.

Goodhart further asserts that private deposit insurance is impractical. Eugenie Short and O'Driscoll (1983), Catherine England (1988), and Selgin (1988a, 135–36) flatly disagree. Glasner (1989, 195–200) and Dowd (1991d, 6–8) both argue that deposit insurance (private or governmental) is unnecessary. Glasner observes that private moneys in the form of mutual fund shares are immune to bank runs, because the holders of such moneys have equity claims, not debt claims. A bank run would simply diminish the wealth of those who possessed the mutual fund shares. Dowd makes a compelling case for believing that capital adequacy is a viable (and perhaps superior) alternative to deposit insurance. As Dowd puts it, "runs can be eliminated when equity-holders maintain a sufficient capital buffer to provide depositors with credible reassurance that their deposits are safe" (1991d, 8).¹¹

England insists that unregulated systems with private insurance would exhibit greater stability than our present system and suffer from little informational asymmetry. This conclusion follows from her beliefs that without federal regulation and insurance, the value to depositors of information about specific institutions would increase, leading to both greater demand for and greater supply of such information, and banks would become more heterogeneous, making easier the differentiation between safe and unsafe institutions (England 1988, 785–86).

Goodhart also feels that "the avoidance of moral hazard requires a degree of regulation and interventionist control over the freedom of bankers" (1988, 104). This is indeed a peculiar suggestion; regulation appears to be the chief source of moral hazard problems rather than the means for their elimination. As O'Driscoll has stated: "The FDIC's pricing of deposit insurance creates a subsidy to risk taking, a subsidy that can only be captured insofar as banks actually make their asset portfolio riskier" (1988, 663). Can the FDIC solve the problem it has created? No. Since regulatory agencies are by nature noncompetitive, non-profit-maximizing entities (a fact Goodhart praises), they are incapable of discovering the appropriate risk premium.¹² Only a market participant has access to such information because it is information generated by a trial-and-error,

market process. Thus, it is that “a rational system of risk-based insurance premiums offered monopolistically by a public agency is simply impossible” (O’Driscoll 1988, 667).

Finally, Goodhart proposes that central banks are a natural evolution, an “obvious solution” to the flaws of unregulated banking. What are the facts? Has the legal creation of central banks been motivated by a desire to increase the public welfare (Goodhart’s position) or by a desire to extract privileges for special-interest groups?

“The Federal Reserve Act was the result of a movement led by bankers . . . hoping to offset the decentralization of banking toward small banks and state banks. The expansion and domination of banking by big city bankers was possible only with the aid of the federal government” (Kolko 1963, 243). Furthermore, “the Federal Reserve was designed to act as a government-sponsored and -enforced cartel promoting the income of banks by preventing free competition from doing its constructive work on behalf of the consumer” (Rothbard 1984a, 135). Roland Vaubel states that central banks have *not* attained their privileged status as a result of out-competing all other banks: “The Bank of England, for example, was granted its monopoly not because it was gaining ground in the market but because it was losing out to the other joint-stock issuing banks which had emerged after the Bank’s joint-stock monopoly had been abolished in 1826” (1986, 933fn).

Glasner offers that “the state monopoly over money emerged not to increase the efficiency of the monetary system but to help the state protect its sovereignty” (1989, 38). One might add that central banks have consistently been utilized by the state as a source of credit.¹³ Even a cursory perusal of history reveals that nation-states, in order to finance wars or massive domestic projects, have found it “necessary” to reduce (or eliminate altogether) competition in banking. Central banks have been the principal tool of governmental expansion. It is no accident that the twentieth century—the “century of collectivism”—is also the century in which central banking became the norm. Richard Wagner sums these points up neatly when he argues that “the support for central banking seems more likely to be explained by the economic theory of rent-seeking than by the theories of market failure and public goods” (1986, 519).

A LENDER OF LAST RESORT

One of the objections to free banking that is most frequently cited is the assertion that banking is inherently “unstable” or “fragile,” and therefore, there must exist some agent outside the market process itself that will come to the aid of individual banks in times of crisis. The problem is said to stem from the fact that banks—unique among financial institutions—perform two different roles. They are both (1) financial intermediaries and portfolio managers, and (2) suppliers of transaction services (Goodhart 1988, 86–87). This allegedly

leads to a fatal flaw. Namely, bank illiquidity can bring about bank insolvency, and the failure of one bank may very well precipitate a run on all banks. In other words, bank runs are inescapable (without a lender of last resort) and potentially disastrous.

A central bank as the ultimate source of liquidity, as the lender of last resort (LOLR), is proposed as the solution to the weaknesses of banking. It would indeed be foolish to claim that commercial banking in the United States, for example, is fundamentally sound, but what is the source of the problem? Are regulation and centralized control the cure—or the disease?

Dowd points the way to an answer when he says that “the experience of relatively free banking . . . appears to lend no support to the claim that systems without a state-sponsored LOLR are more prone to crises . . . the banking system is quite capable of protecting its liquidity provided it is left free to evolve the means to do so” (1989, 39). The necessary means to achieve such protection most fundamentally requires that each bank be free to supply notes to the market as the demand arises. As seen in Chapter 2, a bank that can issue notes is likely to be able to keep a currency run from becoming a redemption run. When private banknotes are forbidden, every increase in the demand for currency relative to deposits drains reserves from the system and brings on large decreases in the money supply.

If freedom of note issue were accompanied by direct—but delayed—convertibility in the form of option clauses, bank panics might be altogether unknown. “Option clauses give note-issuing banks that operate on fractional reserves an effective means of protecting themselves against bank runs” (Dowd 1991h, 761). The reason is disarmingly simple. In the absence of option clauses, a depositor who had the slightest doubt about the bank’s ability to redeem would be motivated to go ahead and demand redemption for fear of not being first at the redemption window. The sudden “panic” behavior on the part of depositors (each of whom is concerned about his or her place in the redemption line) exhausts the liquidity of the bank. This may force the bank to absorb “firesale” losses on assets that are sold in order to accommodate the redemption demands. In short, insolvency may result.¹⁴

On the other hand, the presence of an option clause forestalls the entire process. Its effect is to reward the depositor—via explicit interest payments—for *delaying* the demand for redemption. Option clauses “convert speculative demands for redemption from the destabilizing force they are under full convertibility to a stabilizing force that protects the banks’ reserves when they are run down” (Dowd 1991h, 764).

The problem, however, goes beyond prohibitions of private banknotes and option clauses. The justification for central banks has dwelt on the “financial weaknesses” of commercial banks. Those weaknesses, however, prove on close inspection to be largely, if not entirely, the result of a maze of regulations and restrictions.¹⁵ For example, in the United States, banks have been prevented from reducing risk by means of the diversification of their assets and/or liabil-

ties. The restrictions on diversification have taken the form of antibranching laws (the National Banking Act of 1864 and the McFadden Act of 1927), as well as the stipulation that commercial banks could not underwrite corporate stock and bond issues (the Glass-Steagall Act of 1933). Furthermore, the flat-rate insurance premia of the FDIC's deposit insurance have even encouraged banks to undertake ever-riskier portfolio strategies. Indeed, the very existence of an LOLR itself encourages more risk-taking, especially when loans are offered by that LOLR at *subsidy* rates of interest rather than *penalty* rates. "In doing so they in effect act as lenders, not of last, but of first resort" (Selgin 1989, 442). Ceilings on deposit rates of interest (the Glass-Steagall Act and the Banking Act of 1935) and limitations on bank mergers (the Bank Merger Act of 1966) further harmed banks by reducing their responsiveness to changes in market conditions. Regulation is and has been the problem, not the solution.

SUMMARY

It has long been thought that there exist compelling reasons why private money production by unregulated banks "simply cannot work." These include the beliefs that money is a public good, private money will be held in suboptimal quantities, banking is a natural monopoly, laissez-faire banking is unavoidably inflationary, specie-based currencies imply an inefficient use of resources, multiple currencies encourage counterfeiting, and only a central bank can prevent periodic financial crises. To these may be added the more recent argument that central banks are a natural development necessitated by the instability of decentralized, competitive banking. As was seen above, all such criticisms of free banking are, despite their evident popularity, of questionable merit.

NOTES

1. Some economists emphasize the "joint supply" aspect. This is the proposition that if the good is produced at all, it will be produced in a quantity sufficient to benefit all persons. National defense is supposedly the premier example of such production. Others focus on the proposition that, once it is produced, the marginal cost of a public good is zero.

2. This perspective is totally foreign to many economists. That is, many adhere—implicitly if not explicitly—to a methodological holism rather than to methodological individualism.

3. See Chapter 4 for a discussion of this issue. The core of the problem seems to lie with the unthinking assumption that data are the same as knowledge (or information) in economics. Only those who embrace an individualistic method will apprehend the distinction.

4. The relationship between the two arguments consists of the fact that both involve certain supposed external effects.

5. This is true despite the fact that Friedman's estimate of the potential gains from

achieving optimal money balances is considerably higher than Dowd's (Dowd 1991e, 10).

6. Such payments on demand deposits were ended in the United States only when they were prohibited by the Banking Act of 1933 (perhaps better known as the Glass-Steagall Act).

7. One might see both as *suboptimal* quantities from a utility perspective, but Selgin's point is well taken nevertheless.

8. See Glasner (1989, 238) and Selgin (1990, 281) for further discussion.

9. That self-interest can, of course, follow either an ethic of rational selfishness or an altruist ethic. In other words, "selfishness" and "self-interest" are not synonyms. Noneconomists frequently fail to make the distinction. However, in neither context would a depreciated currency seem desirable.

10. This would remain true even if there were a private clearinghouse. Clearinghouses are organizations that exist primarily in order to facilitate the settling of interbank debts. They are likely to arise spontaneously (and did in actual historical cases). Clearinghouses would probably evolve certain functions in addition to interbank clearings. They might serve as credit information bureaus, monitor questionable practices on the part of the member banks, and assist members by supplying short-term credit (Selgin 1988a, 28–29). Despite a superficial similarity, clearinghouses are *not* central banks. They are, however, capable of performing all the beneficial functions of a central bank.

11. Dowd has long argued that bank reserves are less important to bank safety than is bank capital. This would depend, at least in part, on whether convertibility was direct or indirect.

12. See Chapter 4 for discussion of a similar point.

13. There is a kind of symbiosis at work here. The central bank is granted certain legal privileges—such as establishing its currency as legal tender—in exchange for which it assists the state in achieving certain policy goals.

14. Under free banking, failure would still be unlikely, because banks would have an incentive (in the absence of government deposit insurance) to maintain adequate capital. The topic of capital adequacy is a familiar theme in Dowd's work and one that deserves more attention. Dowd develops his ideas along these lines most effectively when he critiques the Diamond-Dybvig model of bank instability (1991c, 1991d). The Diamond-Dybvig (DD) model (1983) has proven extremely influential and is often taken to be the definitive proof of the proposition that banking is inherently unstable. Briefly, the DD model states that (1) depositors' demands for liquidity are unpredictable, (2) a bank's liabilities (demand deposits) are more liquid (possess a shorter time to maturity) than its assets (its loans outstanding), and (3) therefore, bank runs will occasionally occur unless there exists government deposit insurance and/or a lender of last resort in the form of a central bank. Dowd's very effective rebuttal makes four key points. First, the DD model assumes that all investors exhibit the same attitude toward risk, which ignores the fact that some investors prefer debt and some prefer equity. Second, the "banks" in the DD approach do not resemble real-world banks at all; they are a kind of mutual fund. Third, DD assume that government has access to both certain technology and resources that are unavailable to the private sector. Finally, DD overlook the fact that banks (even with fractional reserves) can forestall runs and panics by holding an adequate capital buffer.

15. See Selgin (1989) for an excellent review of such arguments.

Chapter 9

FINAL THOUGHTS

This book has had two basic goals: (1) to summarize and critique some of the more important theoretical and empirical research on free banking, and (2) to present some of the author's own thoughts on the theory and history of free banking. One hopes that the former has been accomplished in a manner that is both fair to those other researchers at the same time that it offers a clear and insightful exposition to the reader. As for the latter, all writers aim for a presentation that is persuasive. This writer is no exception. If this book builds a persuasive case for free banking, he will be delighted. If it is merely thought-provoking, he will still be more than pleased. Only a few last comments are needed to complete the task.

A METAPHOR

In order to illustrate the point to be made here, a brief digression is first necessary. Assume that an architect has designed a new office building. Assume further that the design is considered completely satisfactory—indeed, excellent—by those who commissioned its execution. Then the structure is built, subject to the local laws and regulations. Those legal constraints require that the builder use only local materials and local labor in the construction. Imagine that those local sources involve inferior materials and laborers of questionable skill. The result is predictable. The elevators do not fit flush with the floors, electrical appliances experience short circuits, doors do not close properly, the roof leaks when it rains, and so forth. In short, the office building is something of a failure; it pleases neither the owners nor the tenants. Would anyone blame the architect under such circumstances? Clearly not. The design was sound; it was the transformation of the design into three-dimensional physical form that

proved inadequate, and the critical fact is that such inadequacy stemmed from violations of the design.

Now think of the free-banking theory of Chapters 2, 3, and 4 as constituting the “design.” Alleged applications of that model (the “building”) were the subject of Chapters 5 and 6, namely the free-banking experiments in Scotland and the United States. As was made clear, neither of those experiments was entirely successful—although at the macrolevel, the American system seems to have worked surprisingly well considering the institutional restrictions imposed. The essential parallel to the architectural metaphor is simply that, since the assumptions of the model were violated in practice, the resulting product was of course flawed. Furthermore, just as with the example of the building, the misapplication of a sound design should lead one to condemn the structure rather than its design; that is, the deficiencies of either Scottish or American free banking cannot with fairness be used as grounds for condemning true laissez-faire banking.

POSSIBLE FUTURE RESEARCH

Free banking is a subject that lies on the frontiers of monetary economics, and as such, it holds out the promise of potentially great rewards to those willing to explore its boundaries. To approach the issue of a future research agenda, one might think in terms of theoretical work, historical investigations, and practical implementations. The theoretical dimensions of free banking that need further attention include (1) the relationship between free banking and business cycles (does free banking constitute the final vindication of Say’s Law, as was suggested in Chapter 3?), (2) the possibility of private deposit insurance (is it necessary, and if so, is it practicable?), (3) the issue of informational asymmetries (why are they likely to pose a smaller problem under free banking than under central banking?), and (4) the effects of option clauses and adequate capital (can they eliminate bank runs completely?).

As to historical research, much more can be done if only the relevant data series can be found or constructed. It would be of obvious benefit, for example, to possess information on national income, unemployment, the money supply, interest rates, and the price level for Scotland (1765–1845) separate from Great Britain as a whole. At the microlevel, information on redemption rates on Scottish banknotes as well as the gold price of such banknotes could prove invaluable. An attractive replication project might be to scrutinize several of the free-banking states in the American South along the lines of Arthur Rolnick and Warren Weber’s examinations of New York, Indiana, Wisconsin, and Minnesota. There are several candidates: Georgia adopted free banking in 1838, Tennessee in 1852, Louisiana and Florida in 1853, and Alabama in 1849. Finally, detailed investigations should be undertaken into the nature and performance of free banking in such other countries as France, Canada, Sweden, Switzerland, China, Australia, New Zealand, South Africa, Spain, and Italy (Selgin

1988a, 7–12). This work has already begun (*see*, for example, Selgin 1987; Jonung 1989; and Dowd 1992).

A crucial question remains: How is the transition to free banking to be accomplished? Only a few works have specifically addressed this issue, and those treatments are all too brief. Donald Wells and Leslie Scruggs propose the following steps: (1) termination of the Fed's monetary powers, that is, the end of both open market operations and discounting; (2) movement of the Treasury's accounts to commercial banks; (3) phasing out over time the Fed's check clearing system so as to encourage the reestablishment of private clearinghouses; (4) repeal of all legal tender laws; (5) establishment of freedom of entry and exit in banking; (6) removal of all reserve requirements, capital requirements, and restrictions on branching; and (7) granting to private institutions the right to issue their own notes (1986b, 264–65).

George Selgin adopts a more cautious approach. He suggests that, after banks have been freed from reserve requirements and limitations on branching, the stock of Federal Reserve notes be frozen. Subsequently, banks could redeem their liabilities in either those Federal Reserve notes or in some commodity, such as gold, depending on consumers' preferences (1988a, 168–71).

Selgin goes on to claim that "there are no great logistic or material barriers standing in the way of the adoption of free banking; the transaction costs of a well-framed free banking reform are negligible" (1988a, 171). This seems a bit naive. Surely there are those—the employees of the Federal Reserve System and the FDIC, for example—who see the complete deregulation of the American financial system as a direct threat to their status and standard of living. Such persons may perceive the transition to a laissez-faire financial environment as extremely costly.

Richard Wagner is closer to the mark when he argues that "those who are interested in monetary reform should recognize that the circumstances they are concerned about reflect the outcome of people's pursuit of their interests within our existing constitutional order. Monetary reform without political reform to redress the rent-seeking excesses of prevailing political institutions seems likely to be a short-lived aberration" (1986, 536).

Much more thought needs to be given to both the enabling conditions and the ramifications of a transition to free banking. Until the pervasive addiction to the welfare state has ended and a belief in laissez-faire capitalism has taken root, free banking may remain a political impossibility. The implementation of free banking could prove to be a task that is as much philosophical as it is technical.

A LAST WORD

Friedrich Hayek declares that "[w]hat we now need is a Free Money Movement comparable to the Free Trade Movement of the 19th century" (1978, 129). He is absolutely correct. Without free banking, inflation and periodic

crises will remain the order of the day. Moreover, as long as money remains a tool of the state, that tool will continue to serve the state as a well-spring of income redistribution, social engineering, and military adventurism. A laissez-faire approach to money and banking is more than merely conducive to efficiency and stability. It is likely to prove to be the necessary precondition for prosperity, justice, and peace.

APPENDIX: A MATHEMATICAL MODEL OF FREE BANKING

The specification of the model takes the following forms:
Implicitly,

$$MD = MD(P; k, y)$$

$$MS = MS(P; S, k, P_s, y)$$

$$Y = Y(P; y)$$

Explicitly,

$$MD = aP + by + ck \quad (1)$$

$$MS = eS + fk - gP_s - hP - jy \quad (2)$$

$$Y = Py \quad (3)$$

where

MD = the nominal demand for money

MS = the nominal supply of money

k = the fraction of income consumers desire to hold as money

y = real national income (output)

S = the specie reserves of banks

P = the price level

P_s = the real unit cost of specie

Y = nominal national income

It is assumed that $a > \emptyset$, $b > \emptyset$, $c > \emptyset$, $e > \emptyset$, $f > \emptyset$, $g > \emptyset$, $h > \emptyset$, $j > \emptyset$, $1 > k > \emptyset$. In equilibrium $MS = MD = M$. Taking M , P , and Y as the endogenous variables of the system, this becomes:

$$M - aP = by + ck \quad (1a)$$

$$M + hP = eS + fk - gP_s - jy \quad (2a)$$

$$Y - Py = \emptyset \quad (3a)$$

Setting this up in the matrix form $Ax = d$, one has the following:

$$\begin{bmatrix} 1 & -a & \emptyset \\ 1 & h & \emptyset \\ \emptyset & -y & 1 \end{bmatrix} \begin{bmatrix} \bar{M} \\ \bar{P} \\ \bar{Y} \end{bmatrix} = \begin{bmatrix} by + ck \\ eS + fk - gP_s - jy \\ \emptyset \end{bmatrix}$$

solving for the determinant $|A| = (h + a) > \emptyset$. Thus, there exists a unique and nontrivial solution to the system. Utilizing Cramer's Rule, one can solve for \bar{M} , \bar{P} , and \bar{Y} , the equilibrium values of M , P , and Y .

$$\bar{M} = \frac{|A_1|}{|A|} = \frac{\begin{vmatrix} by + ck & -a & \emptyset \\ eS + fk - gP_s - jy & h & \emptyset \\ \emptyset & -y & 1 \end{vmatrix}}{(h + a)}$$

$$= \frac{hby + ckh + aeS + afk - agP_s - ajy}{(h + a)}$$

$$\bar{P} = \frac{|A_2|}{|A|} = \frac{\begin{vmatrix} 1 & by + ck & \emptyset \\ 1 & eS + fk - gP_s - jy & \emptyset \\ \emptyset & \emptyset & 1 \end{vmatrix}}{(h + a)}$$

$$= \frac{eS + fk - gP_s - jy - by - ck}{(h + a)}$$

$$\bar{Y} = \frac{|A_3|}{|A|} = \frac{\begin{vmatrix} 1 & -a & by + ck \\ 1 & h & eS + fk - gP_s - jy \\ \emptyset & -y & \emptyset \end{vmatrix}}{(h + a)}$$

$$= \frac{yeS + yfk - ygP_s - jy^2 - bky^2 - cky}{(h + a)}$$

To determine the effects of parametric changes, one may take the partial derivative of each \bar{M} , \bar{P} , and \bar{Y} with respect to k , y , S , and P_s .

If k changes,

$$\frac{\partial \bar{M}}{\partial k} = \frac{(ch + af)}{(h + a)} > \emptyset$$

$$\frac{\partial \bar{P}}{\partial k} = \frac{(f - c)}{(h + a)}$$

To maintain monetary equilibrium,

$$\frac{\partial MD}{\partial k} = \frac{\partial MS}{\partial k} \quad \text{That is, } c = f$$

Therefore,

$$\frac{\partial \bar{P}}{\partial k} = \frac{(f - c)}{(h + a)} = \emptyset$$

and

$$\frac{\partial \bar{Y}}{\partial k} = \frac{y(f - c)}{(h + a)} = \emptyset$$

To summarize,

$$\frac{\partial \bar{M}}{\partial k} > \emptyset, \quad \frac{\partial \bar{P}}{\partial k} = \emptyset, \quad \frac{\partial \bar{Y}}{\partial k} = \emptyset$$

An increase in k increases both the demand for money and the supply of money. The price level and nominal income do not change.

If y changes,

$$\frac{\partial \bar{M}}{\partial y} = \frac{(bh - aj)}{(h + a)}$$

To maintain equilibrium, one must take account of shifts of the curves, that is,

$$\frac{\partial MD}{\partial P} + \frac{\partial MS}{\partial y} = \emptyset, \text{ or } b = j$$

As well as movements along the curves, that is,

$$\frac{\partial MD}{\partial P} + \frac{\partial MS}{\partial P} = \emptyset, \text{ or } a = h$$

Substituting,

$$\begin{aligned}\frac{\partial \bar{M}}{\partial y} &= \frac{(jh - jh)}{(h + a)} = \emptyset \\ \frac{\partial \bar{P}}{\partial y} &= \frac{-(j + b)}{(h + a)} < \emptyset \\ \frac{\partial \bar{Y}}{\partial y} &= \frac{(eS + fk - gP_s - 2jy - 2by - ck)}{(h + a)} \\ &= \frac{(eS + fk - gP_s - jy) - jy - 2by - ck}{(h + a)}\end{aligned}$$

Since

$$(eS + fk - gP_s - jy) = (M + hP), \text{ (Eq. 2a),}$$

then

$$\frac{\partial \bar{Y}}{\partial y} = \frac{M + hP - jy - by - (by + ck)}{(h + a)}$$

Since

$$(by + ck) = (M - aP), \text{ (Eq. 1a),}$$

then

$$\begin{aligned}\frac{\partial \bar{Y}}{\partial y} &= \frac{M + hP - jy - by - M + aP}{(h + a)} \\ &= \frac{(hP + aP - jy - by)}{(h + a)} = \frac{P(h + a) - y(j + b)}{(h + a)}\end{aligned}$$

Following George Selgin (1988a, 98–101; 1990, 272), if one assumes that aggregate demand is unit elastic, $\partial \bar{Y}/\partial P + \partial \bar{Y}/\partial y = \emptyset$, and since $\partial \bar{Y}/\partial P = \emptyset$, then $\partial \bar{Y}/\partial y = \emptyset$. This means that $P(h + a) = y(j + b)$, which is to say that the price level times its effects on MS and MD equals real output times its effects on MS and MD. One may note that if aggregate demand were elastic, then $\partial \bar{Y}/\partial y > \emptyset$, and if aggregate demand were inelastic, then $\partial \bar{Y}/\partial y < \emptyset$. To summarize,

$$\frac{\partial \bar{M}}{\partial y} = \emptyset, \quad \frac{\partial \bar{P}}{\partial y} < \emptyset, \quad \frac{\partial \bar{Y}}{\partial y} = \emptyset$$

A pervasive increase in productivity will drive production costs and the price level down. Nominal money demand rises, while the nominal money supply falls. Nominal money holdings remain the same, as does nominal income.

If S changes, then

$$\frac{\partial \bar{M}}{\partial S} = \frac{ae}{(h+a)} > \emptyset$$

$$\frac{\partial \bar{P}}{\partial S} = \frac{e}{(h+a)} > \emptyset$$

$$\frac{\partial \bar{Y}}{\partial S} = \frac{ye}{(h+a)} > \emptyset$$

If there occurs an unanticipated increase in the supply of specie (monetary gold), then the money stock, the price level, and nominal national income all rise. It is more likely, however, that such a change in the production of specie would be preceded by an increase in the demand for same. In other words, first k_o rises and k_i falls. This constitutes a redemption run.

For changes in k_i ,

$$\frac{\partial \bar{M}}{\partial k_i} = \frac{(ch+af)}{(h+a)} > \emptyset$$

$$\frac{\partial \bar{P}}{\partial k_i} = \frac{(f-c)}{(h+a)} = \emptyset$$

$$\frac{\partial \bar{Y}}{\partial k_i} = \frac{y(f-c)}{(h+a)} = \emptyset$$

For changes in the real cost of specie (P_s),

$$\frac{\partial \bar{M}}{\partial P_s} = \frac{-ag}{(h+a)} < \emptyset$$

$$\frac{\partial \bar{P}}{\partial P_s} = \frac{-g}{(h+a)} < \emptyset$$

$$\frac{\partial \bar{Y}}{\partial P_s} = \frac{-yg}{(h+a)} < \emptyset$$

The relative demand for specie rises, driving up its price (P_s). The desired ratio of outside money to inside money, k_o/k_i , also rises. The inside money supply falls by a

larger proportional amount than the outside money supply rises. The price level and nominal income decline. Subsequently, the supply of specie increases. This increases both the outside and inside money supplies, the price level, and nominal income.

A currency run occurs when consumers choose to liquidate part or all of their deposit accounts in order to acquire currency. Currency runs pose a deflationary threat to central banking systems, because all currency runs are also redemption runs. This follows from the facts that (1) there is a single monopoly issuer of currency, and (2) in such a system, the legal tender currency serves both as currency for the public and as part of the reserves of commercial banks.

Under central banking,

$$MS = C + DD \text{ and } MB = C + R,$$

where

MS = the money supply

C = currency held by the public

DD = demand deposits

MB = the monetary base

R = bank reserves (vault cash plus deposits with the central bank)

If the statutory reserve ratio is RR , then $RR = \frac{R}{DD}$ or $DD = \frac{R}{RR}$. Substituting the expression for DD back into the earlier expression for MS , $MS = C + \frac{R}{RR}$. Since $R = MB - C$, then $MS = C + \frac{(MB-C)}{RR}$ and $\frac{\partial MS}{\partial C} = (1 - 1/RR) < 0$.

This last is clearly negative as long as $RR < 1$, that is, as long as there is fractional reserve banking. Also, $|1 - 1/RR| > 1$ if $RR < .5$, which is very likely. For example, if the legal tender reserve ratio is 0.1 and consumers exchange \$1 million in deposit credits for \$1 million in currency, for any given monetary base, the net effect on the money supply will be a decrease of \$9 million.

Under free banking,

$$MS = N + DD \text{ and } MB = S$$

where

MS = the inside money supply

N = privately issued banknotes

DD = demand deposits

MB = the monetary base

S = banks' specie reserves

If OR_N is the optimal reserve ratio for notes, OR_{DD} is the optimal reserve ratio for demand deposits, S_N the specie reserves for notes, and S_{DD} the specie reserves for demand deposits, then

$$OR_N = \frac{S_N}{N} \text{ and } OR_{DD} = \frac{S_{DD}}{DD}$$

or

$$N = \frac{S_N}{OR_N} \text{ and } DD = \frac{S_{DD}}{OR_{DD}}$$

If all free banks exhibit the same optimal reserve ratios for each deposits and notes, then $OR_N = OR_{DD} = OR$.

Keeping in mind that specie reserves can be used to redeem either notes or deposits, the above expression for the money supply may be transformed such that

$$MS = N + DD = \frac{S_N + S_{DD}}{OR} = \frac{S}{OR}$$

Thus,

$$\frac{\partial MS}{\partial N} = \emptyset$$

An increased relative demand for currency (versus deposits) has no net effect on the money supply under free banking. It is not necessary for a currency run to become a redemption run, as is the case under central banking.

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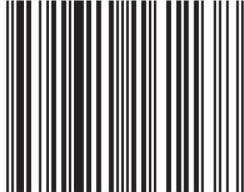
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