EH.net Home
EHA Home
Book Reviews
- Editors
- Previous Newsletter Issues
- Reviewers
- Browse Library
- Copyright

Course Syllabi
Conferences
Databases
Directory
Encyclopedia
MeasuringWorth
In Memoriam
Mailing Lists
Related Sites

a monetary history of Search

Elusive Union: The Process of Economic and Monetary Union in Europe

Author(s): Dyson, Kenneth

Reviewer(s): Fuller, Elaine

?

Review of ELUSIVE UNION THE PROCESS OF ECONOMIC AND MONETARY UNION IN EUROPE by Kenneth Dyson (Longman, London and New York, 1994) 370 pages

Reviewed by Elaine Fuller Ph.D. student in Economics and Historical Studies New School for Social Research Center for Studies of Social Change 64 University Place New York City 10003 tel: 212/533-9341 fax: 212/477-5409 e-mail: fuller@cssc.newschool.edu

This review has three sections: Argument of Book, Organization of Book, A Critique

I. Argument of Book

In this important book on the political move towards monetary union by which a number of European nations would use one circulating and reserve currency, Professor Dyson takes on a difficult task; his subject matter is a complex long-term political process concerning economic and monetary issues, yet these issues themselves are not his focus. It is, rather, with questions about how the policy process has been shaped and guided: who are the actors with agenda-setting and veto power; what kinds of bargaining relations exist among them; who establishes the `rules of the game'; how do we explain the emergence and development of the policy process. He wants to restore political reasons to their proper place in his explanatory story, something that is all-too-often completely ignored in studies of economic and financial issues.

Dyson centers his analysis in an institutional and game theory approach which seems quite suitable to the subject matter. His central argument is that the policy process establishing the existing European Monetary System and the goal of creating a full-fledged European Monetary Union is best understood as composed of a distinct set of interdependent bargaining relations and institutional rules of the game, embedded in a framework of structures that they have a limited, and fluctuating, capacity to influence. There is a complex interaction between the structural dynamics of the international political economy and the internal dynamics of the EMS and EMU policy process.

Furthermore, the nature of the European integration process is shaped by the will and the capability of the central actors involved, which can be fully appreciated only as a set of interlocking bargaining relations that, in turn, interact with certain key rules of the game. All of these — actors, bargaining relations and rules — are embedded in five general sources of structural power — world currency relations, `fundamentals' of each country, and trade interdependence. (This statement of the central argument is distilled from various pages in the introductory Chapter 1.)

Interaction among these sources of structural power generates a lack of consistent control by any one actor. There is no hegemon, to use an older term. This is the essence of Dyson's argument of the hollow core in the EMU policy process. Furthermore, EMU remains a fragile prospect because it rests on decisions to pursue monetary union prior to having in place a strong unified political union to give it necessary support and establish the rules of the game. In this `two-level' policy process (the separation of activities toward political union and toward monetary union) monetary union is being pursued in a highly elitist fashion by financial technicians, central bankers and their international political cohorts. Thus, it generates resistance among people in various countries who cannot see it as part of a known political process. Money, Dyson tells us, has not only an economic and technical face, but a cultural and political face. (p. 3 – 5) It symbolizes national identity and sovereignty.

II. Organization of Book

Dyson introduces the theme of monetary union requiring prior political authority in his introductory chapter (Ch.2) on five historical monetary unions. Two of them, the Federal Reserve System of the United States and the German centralized system are strong and successful national monetary unions; that is, political union preceded monetary union. The other three were international — the Latin Monetary Union of 1865, the international gold standard and the Bretton Woods System — which fell apart when the hegemonic nation at their center began to lose control.

The second history chapter takes us through the activities around monetary coordination in Europe after the Second World War. It briefly summarizes the European Payments Union of the 1950s, the institutions and programs of the European Economic Community of the 1960s, responses to the disintegration of the Bretton Woods system (the `snake' by which EEC country currencies were to float together, or rather, float with the D-Mark; the `snake in the tunnel' by which they were to float together around a dollar parity with fluctuations kept within a narrower band than that allowed other currencies in the IMF) and finally to the dollar crisis of the late 1970s which fostered the birth of the Exchange Rate System in which outlines of the original `snake' could still be discerned.

It is only at Chapter 4 that we arrive at the heart of the book's subject: an historical narrative, thick with detail, which takes us through the bargaining relations and configurations of power in two periods of major change — 1978-79 and 1988-91. The first period saw creation of the European Monetary System in 1979 ,rapid implementation of a European Monetary Union with a single currency, which would replace the Exchange Rate Mechanism in which member countries must try to maintain set exchange rate parities but also negotiate changes in them as frequently as necessary. (Ch.5)

We get a good sense of the importance of central banks; of Britain's loss of power; of the relevance of the right people at the right place at the right time (and the wrong time); of the centrality of Franco-German bargaining; and, most of all, of the centrality of Germany. Even that is more complex because one of the most central bargaining fronts is between the German government and the independent Bundesbank. The Bundesbank always thinks in terms of what is good for Germany according to its convervative

banking philosophy. In this sense, it is not an international player but a national player thrust onto the international stage with a lead role it does not want.

The German government, on the other hand, is led by men who experienced the Second World War and must carry with them their country's horrible past in the mid-twentieth century. Taking a lead in forming the European Monetary System as a response to American `abdication' of international responsibility (with the 1978 dollar crisis and, indeed, earlier with the demise of Bretton Woods) would bring some redemption in the role of a constructive and good international partner.

Underlying these political considerations, however, is the economic reality that the postwar German economy has been the engine of growth for Europe. This has been the primary asymmetry in the `economic fundamentals' which spawned asymmetries in currency strength and bargaining power. The German government and the Bundesbank could not always have things their own way but nothing could happen without their cooperation. As Dyson puts it "the one veto position that really mattered" and "the pivot around which a balance had to be found." (p.155)

Yet because of its past, Germany must express its power through international cooperation rather than acting openly as the hegemon of Europe, while other countries, particularly France, are concerned to curtail German power without destroying that international cooperation.

Dyson follows Part I on historical perspectives with Part II on theoretical perspectives which focuses on the sources of structural power: the `two-level' policy process; the D-Mark as anchor currency; the ascendance of monetarism over the kind of expansionary policies known as Keynesianism; changes in financial markets, in production and distribution and employment (the economic fundamentals), in trade patterns.

III. A Critique

It is these mostly economic issues in Part II that this book; a reader with economist's eyes who kept feeling there was something crucial missing from the historical narrative of the first 175 pages. Admittedly, Elusive Unionis about a political process and as such, it highlights a general failing of economists who take specific political configurations as givens when, in fact, contingent policy processes concerning economic activity need to become variables. Yet, at the same time, the book is about political processes concerning economic organization and activity and, therefore, cannot help but deal with economics if it is to be comprehensive. But then, how to model such a complexity or even to incorporate the political and economic in the same narrative? It is not easy; Dyson's not unreasonable solution is a book with two parts, but this tends, I think, to weaken his project by muting the economic debates and questions he rightly considers the key ones. They are in there but they tend to get lost; they don't stand out clearly as they should.

It would have been better, I think, to have tried to integrate political process and economic structure and to have presented at the beginning a clear schema of various relevant historical economic debates: the economic and political defferences between fixed vs. flexible vs. freely floating exchange rates and why the latter has rarely been supported by anyone but economic theorists; who generally does and does not benefit by exchange controls and capital controls; how exchange rates and particular adjustment mechanisms for curing balance-of-payments deficits (but not surpluses) are connected to questions of sufficient liquidity for full employment economic growth and inflation; what it would mean to different sectors of society in each country to force convergence among them of money supply changes, interest rates, inflation rates, current-account balances, and especially fiscal policies and deficit spending

decisions. Then tracing such issues through the political narrative would give it clearer economic meaning.

Although almost all these economic questions are historic issues, they don't directly appear in the initial narrative on historic monetary unions because of its focus on the necessity of prior political union. This important but narrow focus leaves this introductory chapter seeming both rather superficial and yet too much at the same time.

For example, on p.32 Dyson refers to obstacles "all the more apparent when one considers the difficulties of moving from political to monetary union in relatively homogeneous cultural areas like Germany and the United States." But was cultural homogeneity the dominant dynamic involved in struggles around establishing central control over monetary activity? Which were the economic forces in late 19th and early 20th century USA that supported and that opposed a central bank? Who would benefit from decentralized and unregulated currency? What about the argument that money creation based on decentralized banking may have been unstable but nevertheless supplied the necessary liquidity for economic growth?

Yet, on the other hand, Germany had a high level of growth in the late 19th and early 20th century with a highly centralized banking system, yet how independent was the Reichsbank from government control? This question of the independence of central banks from government directives geared to particular political interests could have used a more systematic historical presentation, especially given the Bundesbank's importance in the process toward a European Monetary Union. This should have included the history leading up to the Bundesbank Act of 1957 in which it is explicitly stated that the central bank shall be independent of instructions from the federal government, a history which included loss of independence under the Nazis.

Nevertheless, Elusive Union is necessary reading for anyone seriously interested in the prospects of European Union and a basis for further discussion and debate. I found myself imagining how interesting a debate between Kenneth Dyson and Alan Milward might be. Milward argued in The Rescue of the European Nation (1992) that participation in the European Community was often a means for nation-states to reinforce national interests rather than subsuming them into common interests of a more unified Europe. On several occasions, Dyson makes reference to some process that might fit this interpretation — France, for instance, coming around to supporting the idea of EMU in the late 1980s because of learning the political lesson "that the EMS involved an asymmetry of power that imposed undue costs on some countries and that could be corrected only by shifting authority to the EC level." (p.113) But, he makes only one reference to Milward's book and implies that a stage in the EC when "traditional patterns of contending states whose interests were defined by domestic political and economic constituencies" (p.92) may now have been superceded by the renewed launch toward an European Moneatry Union as part of European Union — unless it turns out to be forever elusive.

Financial Crises, 1929 to the Present

Author(s): Hsu, Sara

Reviewer(s): Wheelock, David C.

Published by EH.Net (November 2014)

Sara Hsu, *Financial Crises, 1929 to the Present*. Cheltenham, UK: Edward Elgar, 2013. v + 178 pp. $100 (cloth), ISBN: 978-0-85793-342-3.

Reviewed for EH.Net by David C. Wheelock, Federal Reserve Bank of St. Louis.

In *Financial Crises, 1929 to the Present*, Sara Hsu of the State University of New York, New Paltz, offers a concise history of several of the world's major financial crises — from the Great Depression to the subprime mortgage crisis of 2007-08 and European debt crisis of 2009-10.

Financial crises are not easy to define precisely, except perhaps in the context of a stylized model, and different authors have used a variety of quantitative measures to identify and measure the severity of crises. In the first chapter of the book, Hsu explains how different authors define financial crises, focusing especially on the ideas of Hyman Minsky and Charles Kindleberger. Hsu provides neither a precise theoretical nor a quantitative definition of a financial crisis, but aligns herself with Minsky in concluding that unregulated financial systems of capitalist economies are inherently prone to instability and crises with potentially severe macroeconomic repercussions: "Hyman Minsky was right in the sense that given free rein, capitalism has created instability and unanticipated crises" (p. 146).

After a brief summary of how the global financial system has evolved since the 1930s, subsequent chapters review the histories of individual crises, beginning with the Great Depression. Hsu follows John Kenneth Galbraith in tracing the origins of the Great Depression to Wall Street speculation and attributes the eventual market crash to heightened uncertainty and a global credit crunch associated with French claims on British gold and the introduction of the Young Plan in 1929. Although she acknowledges the decline in the money stock and deflation that took hold after the crash, Hsu rejects the view of Friedman and Schwartz (1963) that banking panics and a contracting money supply caused the Great Depression, favoring instead Ben Bernanke's (1983) emphasis on the nonmonetary effects that financial crises had on the economy.

The Great Depression led to major changes in the regulation of U.S. banks and financial markets, as well as disintegration of the international gold standard and the imposition of capital and exchange controls around the world. Controls became universal during World War II and remained in place for several years after the war under the post-war Bretton Woods system of fixed exchange rates. Hsu nicely summarizes key features of the Bretton Woods System and its breakdown in the 1970s in the book's third chapter.

The remaining chapters summarize major financial crises, beginning with the debt crises of emerging market economies in the 1980s. Hsu explains how many emerging market economies had borrowed heavily to support economic growth when commodity prices were rising in the 1970s, only to experience difficulty servicing their debts and obtaining new loans when commodity prices fell after the Federal Reserve tightened monetary policy and the U.S. economy went into recession in the early 1980s. This chapter has an especially good summary of how the debt crisis unfolded in different countries and how lenders, governments, and the IMF responded.

Hsu next discusses several crises that occurred in the 1990s, including the Western European exchange rate crisis, Nordic banking crises, Japanese real estate collapse and subsequent "lost decade," Mexican debt crisis, and Asian financial crisis. A subsequent chapter describes the Russian and Brazilian financial crises of 1998 and the Argentinian crisis of 2000. Like many others, Hsu is highly critical of the "conditionality" requirements imposed by the IMF on nations in crisis. For example, she argues that

“The IMF program for Korea went beyond measures needed to resolve the crisis … and, destructively, called for even wider opening(!) of Korea’s capital and current accounts” (p. 91).

The penultimate chapter of the book focuses on the subprime mortgage crisis and recession of 2007-08, which originated in the United States but was felt around the world, and the European debt crisis that emerged in 2009-10. For Hsu, “the crisis showed that all financial markets are unstable and require constant supervision and regulation” (p. 129). She blames “excessive overleveraging” of subprime assets in the form of opaque financial instruments created by a largely unregulated and unsupervised banking system and the trading of those securities “over the counter” rather than through organized and regulated exchanges. She argues that much of the government’s response to the crisis, such as the Troubled Asset Relief Program, was flawed and failed to halt the crisis.

The final chapter considers alternative policies for preventing future crises and for containing and resolving any crises that might occur. Hsu is generally supportive of capital controls, macro-prudential bank regulations, and countercyclical fiscal and monetary policy, as well as greater coordination of policies across countries. Indeed, she argues that “The preeminence of country sovereignty and competitiveness over global financial stability ensures that fault lines will exist and expand, and that crises will continue to occur. Should country priorities shift en masse from economic growth to economic and financial stability, there is a much greater probability that future financial crises might be prevented” (p. 146).

The book could serve as a supplement for undergraduate courses in economic history, international finance, and macroeconomics or as a reference for anyone wishing summaries of the key events and issues surrounding particular crises. However, the book might hold less appeal for courses in U.S. economic history because it does not cover several noteworthy episodes of financial instability in the United States, such as the savings and loan crisis of the 1980s. Further, readers interested in more theoretical explanations of the causes and effects of financial crises or those interested in the interplay of political and economic forces that shape the financial regulatory environment and can promote instability and crises even in highly regulated financial systems, as discussed recently by Charles Calomiris and Stephen Haber (2014), will want to look elsewhere.

References:

Bernanke, Ben S. “Nonmonetary Effects of the Financial Crisis in the Propagation of the Great Depression,” *American Economic Review* 73(3), June 1983, pp. 257-76.

Calomiris, Charles W. and Stephen H. Haber. *Fragile by Design: The Political Origins of Banking Crises and Scarce Credit.* Princeton: Princeton University Press, 2014.

Friedman, Milton and Anna J. Schwartz. *A Monetary History of the United States, 1867-1960*. Princeton: Princeton University Press, 1963.

David C. Wheelock researches U.S. financial and monetary history. His recent publications include (with Michael D. Bordo), “The Promise and Performance of the Federal Reserve as Lender of Last Resort,” in M.D. Bordo and W. Roberds, editors, *The Origins, History, and Future of the Federal Reserve: A Return to Jekyll Island*. Cambridge University Press, 2013.

Subject(s): Financial Markets, Financial Institutions, and Monetary History

Geographic Area(s): General, International, or Comparative

Time Period(s): 20th Century: Pre WWII
20th Century: WWII and post-WWII

U.S. Economy in World War I

Hugh Rockoff, Rutgers University

Although the United States was actively involved in World War I for only nineteen months, from April 1917 to November 1918, the mobilization of the economy was extraordinary. (See the chronology at the end for key dates). Over four million Americans served in the armed forces, and the U.S. economy turned out a vast supply of raw materials and munitions. The war in Europe, of course, began long before the United States entered. On June 28, 1914 in Sarajevo Gavrilo Princip, a young Serbian revolutionary, shot and killed Austrian Archduke Franz Ferdinand and his wife Sophie. A few months later the great powers of Europe were at war.

Many Europeans entered the war thinking that victory would come easily. Few had the understanding shown by a 26 year-old conservative Member of Parliament, Winston Churchill, in 1901. "I have frequently been astonished to hear with what composure and how glibly Members, and even Ministers, talk of a European War." He went on to point out that in the past European wars had been fought by small professional armies, but in the future huge populations would be involved, and he predicted that a European war would end "in the ruin of the vanquished and the scarcely less fatal commercial dislocation and exhaustion of the conquerors."[1]

Reasons for U.S. Entry into the War

Once the war began, however, it became clear that Churchill was right. By the time the United States entered the war Americans knew that the price of victory would be high. What, then, impelled the United States to enter? What role did economic forces play? One factor was simply that Americans generally – some ethnic minorities were exceptions – felt stronger ties to Britain and France than to Germany and Austria. By 1917 it was clear that Britain and France were nearing exhaustion, and there was considerable sentiment in the United States for saving our traditional allies.

The insistence of the United States on her trading rights was also important. Soon after the war began Britain, France, and their allies set up a naval blockade of Germany and Austria. Even food was contraband. The Wilson Administration complained bitterly that the blockade violated international law. U.S. firms took to using European neutrals, such as Sweden, as intermediaries. Surely, the Americans argued, international law protected the right of one neutral to trade with another. Britain and France responded by extending the blockade to include the Baltic neutrals. The situation was similar to the difficulties the United States experienced during the Napoleonic wars, which drove the United States into a quasi-war against France, and to war against Britain.

Ultimately, however, it was not the conventional surface vessels used by Britain and France to enforce its blockade that enraged American opinion, but rather submarines used by Germany. When the British (who provided most of the blockading ships) intercepted an American ship, the ship was escorted into a British port, the crew was well treated, and there was a chance of damage payments if it turned out that the interception was a mistake. The situation was very different when the Germans turned to submarine warfare. German submarines attacked without warning, and passengers had little chance of to save themselves. To many Americans this was a brutal violation of the laws of war. The Germans felt they had to use submarines because their surface fleet was too small to defeat the British navy let alone establish an effective counter-blockade.

The first submarine attack to inflame American opinion was the sinking of the *Lusitania* in May 1915. The *Lusitania* left New York with a cargo of passengers and freight, including war goods. When the ship was sunk over 1150 passengers were lost including 115 Americans. In the months that followed further sinkings brought more angry warnings from President Wilson. For a time the Germans gave way and agreed to warn American ships before sinking them and to save their passengers. In February 1917, however, the Germans renewed unrestricted submarine warfare in an attempt to starve Britain into submission. The loss of several U.S. ships was a key factor in President Wilson's decision to break diplomatic relations with Germany and to seek a declaration of war.

U.S. Entry into the War and the Costs of Lost Trade

From a crude dollar-and-cents point of view it is hard to justify the war based on the trade lost to the United States. U.S. exports to Europe rose from $1.479 billion dollars in 1913 to $4.062 billion in 1917. Suppose that the United States had stayed out of the war, and that as a result all trade with Europe was cut off. Suppose further, that the resources that would have been used to produce exports for Europe were able to produce only half as much value when reallocated to other purposes such as producing goods for the domestic market or exports for non-European countries. Then the loss of output in 1917 would have been $2.031 billion per year. This was about 3.7 percent of GNP in 1917, and only about 6.3 percent of the total U.S. cost of the war.[2]

On March 21, 1918 the Germans launched a massive offensive on the Somme battlefield and successfully broke through the Allied lines. In May and early June, after U.S. entry into the war, the Germans followed up with fresh attacks that brought them within fifty miles of Paris. Although a small number of Americans participated it was mainly the old war: the Germans against the British and the French. The arrival of large numbers of Americans, however, rapidly changed the course of the war. The turning point was the Second Battle of the Marne fought between July 18 and August 6. The Allies, bolstered by significant numbers of Americans, halted the German offensive.

The initiative now passed to the Allies. They drove the Germans back in a series of attacks in which American troops played an increasingly important role. The first distinctively American offensive was the battle of the St. Mihiel Salient fought from September 12 to September 16, 1918; over half a million U.S. troops participated. The last major offensive of the war, the Meuse-Argonne offensive, was launched on September 26, with British, French, and American forces attacking the Germans on a broad front. The Germans now realized that their military situation was deteriorating rapidly, and that they would have to agree to end to the fighting. The Armistice occurred on November 11, 1918 – at the eleventh hour, of the eleventh day, of the eleventh month.

Mobilizing the Economy

The first and most important mobilization decision was the size of the army. When the United States entered the war, the army stood at 200,000, hardly enough to have a decisive impact in Europe. However, on May 18, 1917 a draft was imposed and the numbers were increased rapidly. Initially, the expectation was that the United States would mobilize an army of one million. The number, however, would go much higher. Overall some 4,791,172 Americans would serve in World War I. Some 2,084,000 would reach France, and 1,390,000 would see active combat.

Once the size of the Army had been determined, the demands on the economy became obvious, although the means to satisfy them did not: food and clothing, guns and ammunition, places to train, and the means of transport. The Navy also had to be expanded to protect American shipping and the troop transports. Contracts immediately began flowing from the Army and Navy to the private sector. The result, of course, was a rapid increase in federal spending from $477 million in 1916 to a peak of $8,450 million in 1918. (See Table 1 below for this and other data on the war effort.) The latter figure amounted to over 12 percent of GNP, and that amount excludes spending by other wartime agencies and spending by allies, much of which was financed by U.S. loans.

Table 1
Selected Economic Variables, 1916-1920

	1916	1917	1918	1919	1920
1. Industrial production (1916 =100)	100	132	139	137	108
2. Revenues of the federal government (millions of dollars)	$930	2,373	4,388	5,889	6,110
3. Expenditures of the federal government (millions of dollars)	$1,333	7,316	15,585	12,425	5,710
4. Army and Navy spending (millions of dollars)	$477	3,383	8,580	6,685	2,063
5. Stock of money, M2 (billions of dollars)	$20.7	24.3	26.2	30.7	35.1
6. GNP deflator (1916 =100)	100	120	141	160	185
7. Gross National Product (GNP) (billions of dollars)	$46.0	55.1	69.7	77.2	87.2
8. Real GNP (billions of 1916 dollars)	$46.0	46.0	49.6	48.1	47.1
9. Average annual earnings per full-time manufacturing employee (1916 dollars)	$751	748	802	813	828
10. Total labor force (millions)	40.1	41.5	44.0	42.3	41.5
11. Military personnel (millions)	.174	.835	2.968	1.266	.353

Sources by row:

1. Miron and Romer (1990, table 2).

2-3. U.S. Bureau of the Census (1975), series Y352 and Y457.

4. U.S. Bureau of the Census (1975), series Y458 and Y459. The estimates are the average for fiscal year t and fiscal year t+1.

5. Friedman and Schwartz (1970, table 1, June dates).

6-8. Balke and Gordon (1989, table 10, pp. 84-85).The original series were in 1982 dollars.

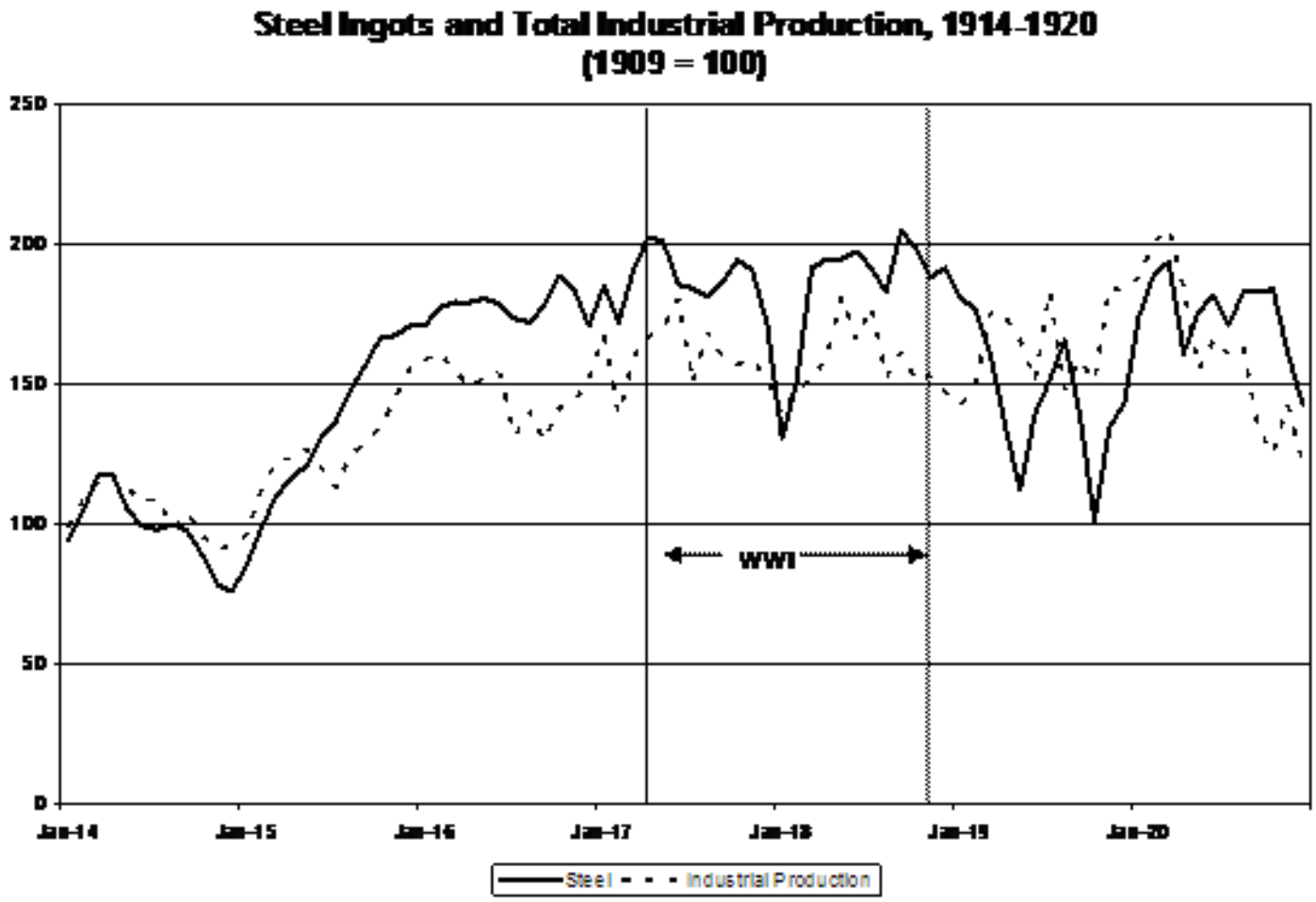
9. U.S. Bureau of the Census (1975), series D740.

10-11. Kendrick (1961, table A-VI, p. 306; table A-X, p. 312).

Although the Army would number in the millions, raising these numbers did not prove to be an unmanageable burden for the U.S economy. The total labor force rose from about 40 million in 1916 to 44 million in 1918. This increase allowed the United States to field a large military while still increasing the labor force in the nonfarm private sector from 27.8 million in 1916 to 28.6 million in 1918. Real wages rose in the industrial sector during the war, perhaps by six or seven percent, and this increase combined with the ease of finding work was sufficient to draw many additional workers into the labor force.[3] Many of the men drafted into the armed forces were leaving school and would have been entering the labor force for the first time in any case. The farm labor force did drop slightly from 10.5 million in 1916 to 10.3 million workers in 1918, but farming included many low-productivity workers and farm output on the whole was sustained. Indeed, the all-important category of food grains showed strong increases in 1918 and 1919.

Figure 1 shows production of steel ingots and "total industrial production" – an index of steel, copper, rubber, petroleum, and so on – monthly from January 1914 through 1920.[4] It is evident that the United States built up its capacity to turn out these basic raw materials during the years of U.S. neutrality when Britain and France were its buying supplies and the United States was beginning its own tentative build up. The United States then simply maintained the output of these materials during the years of active U.S. involvement and concentrated on turning these materials into munitions.[5]

Figure 1



Prices on the New York Stock Exchange, shown in Figure 2, provide some insight into what investors thought about the strength of the economy during the war era. The upper line shows the Standard and Poor's/Cowles Commission Index. The lower line shows the "real" price of stocks – the nominal index divided by the consumer price index. When the war broke out the New York Stock Exchange was closed

to prevent panic selling. There are no prices for the New York Stock Exchange, although a lively "curb market" did develop. After the market reopened it rose as investors realized that the United States would profit as a neutral. The market then began a long slide that began when tensions between the United States and Germany rose at the end of 1916 and continued after the United States entered the war. A second, less rise began in the spring of 1918 when an Allied victory began to seem possible. The increase continued and gathered momentum after the Armistice. In real terms, however, as shown by the lower line in the figure, the rise in the stock market was not sufficient to offset the rise in consumer prices. At times one hears that war is good for the stock market, but the figures for World War I, as the figures for other wars, tell a more complex story.[6]

Figure 2

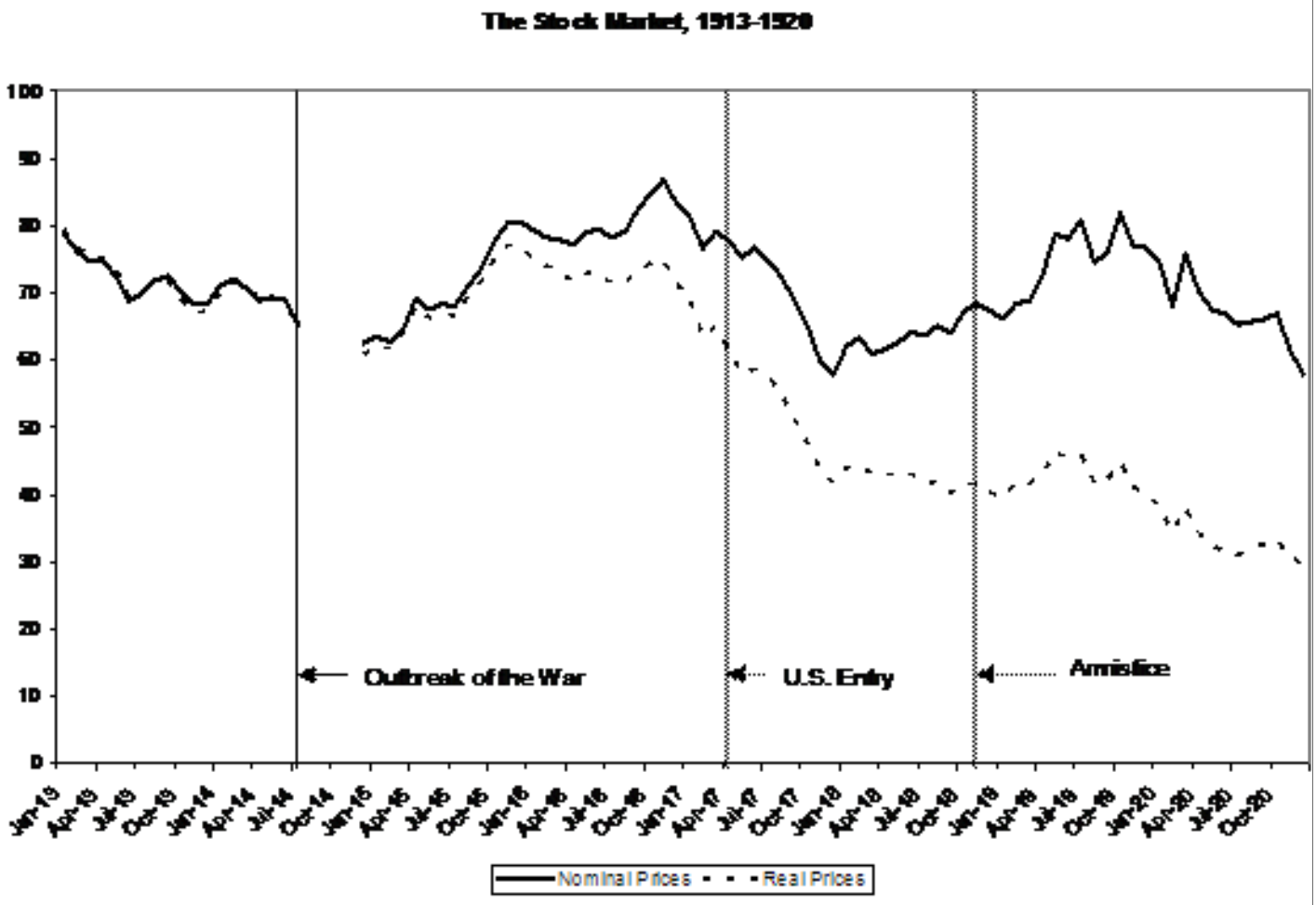


Table 2 shows the amounts of some of the key munitions produced during the war. During and after the war critics complained that the mobilization was too slow. American troops, for example, often went into battle with French artillery, clearly evidence, the critics implied, of incompetence somewhere in the supply chain. It does take time, however, to convert existing factories or build new ones and to work out the details of the production and distribution process. The last column of Table 2 shows peak monthly production, usually October 1918, at an annual rate. It is obvious that by the end of the war the United States was beginning to achieve the "production miracle" that occurred in World War II. When Franklin Roosevelt called for 50,000 planes in World War II, his demand was seen as an astounding exercise in bravado. Yet when we look at the last column of the table we see that the United States was hitting this level of production for Liberty engines by the end World War I. There were efforts during the war to coordinate Allied production. To some extent this was tried – the United States produced much of the smokeless powder used by the Allies – but it was always clear that the United States wanted its own army equipped with its own munitions.

Table 2
Production of Selected Munitions in World War I

Munition	Total Production	Peak monthly production at an annual rate
Rifles	3,550,000	3,252,000
Machine guns	226,557	420,000
Artillery units	3,077	4,920
Smokeless powder (pounds)	632,504,000	n.a.
Toxic Gas (tons)	10,817	32,712
De Haviland-4 bombers	3,227	13,200
Liberty airplane engines	13,574	46,200

Source: Ayres (1919, *passim*)

Financing the War

Where did the money come from to buy all these munitions? Then as now there were, the experts agreed, three basic ways to raise the money: (1) raising taxes, (2) borrowing from the public, and (3) printing money. In the Civil War the government had had simply printed the famous greenbacks. In World War I it was possible to "print money" in a more roundabout way. The government could sell a bond to the newly created Federal Reserve. The Federal Reserve would pay for it by creating a deposit account for the government, which the government could then draw upon to pay its expenses. If the government first sold the bond to the general public, the process of money creation would be even more roundabout. In the end the result would be much the same as if the government had simply printed greenbacks: the government would be paying for the war with newly created money. The experts gave little consideration to printing money. The reason may be that the gold standard was sacrosanct. A financial policy that would cause inflation and drive the United States off the gold standard was not to be taken seriously. Some economists may have known the history of the greenbacks of the Civil War and the inflation they had caused.

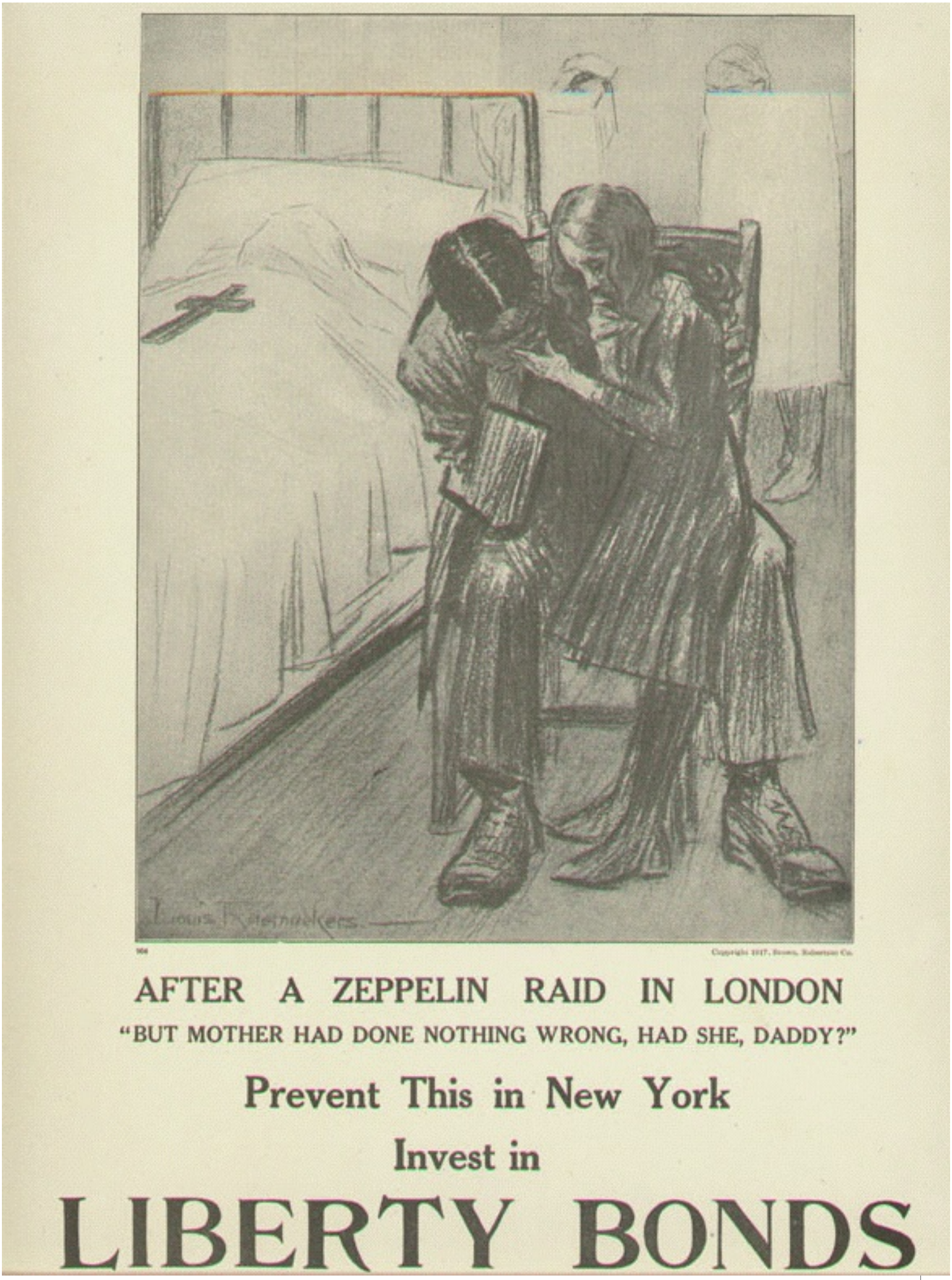
The real choice appeared to be between raising taxes and borrowing from the public. Most economists of the World War I era believed that raising taxes was best. Here they were following a tradition that stretched back to Adam Smith who argued that it was necessary to raise taxes in order to communicate the true cost of war to the public. During the war Oliver Morton Sprague, one of the leading economists of the day, offered another reason for avoiding borrowing. It was unfair, Sprague argued, to draft men into the armed forces and then expect them to come home and pay higher taxes to fund the interest and principal on war bonds. Most men of affairs, however, thought that some balance would have to be struck between taxes and borrowing. Treasury Secretary William Gibbs McAdoo thought that financing about 50 percent from taxes and 50 percent from bonds would be about right. Financing more from taxes, especially progressive taxes, would frighten the wealthier classes and undermine their support for the war.

In October 1917 Congress responded to the call for higher taxes with the War Revenue Act. This act increased the personal and corporate income tax rates and established new excise, excess-profit, and

luxury taxes. The tax rate for an income of $10,000 with four exemptions (about $140,000 in 2003 dollars) went from 1.2 percent in 1916 to 7.8 percent. For incomes of $1,000,000 the rate went from 10.3 percent in 1916 to 70.3 percent in 1918. These increase in taxes and the increase in nominal income raised revenues from $930 million in 1916 to $4,388 million in 1918. Federal expenditures, however, increased from $1,333 million in 1916 to $15,585 million in 1918. A huge gap had opened up that would have to be closed by borrowing.

Short-term borrowing was undertaken as a stopgap. To reduce the pressure on the Treasury and the danger of a surge in short-term rates, however, it was necessary to issue long-term bonds, so the Treasury created the famous Liberty Bonds. The first issue was a thirty-year bond bearing a 3.5% coupon callable after fifteen years. There were three subsequent issues of Liberty Bonds, and one of shorter-term Victory Bonds after the Armistice. In all, the sale of these bonds raised over $20 billion dollars for the war effort.

In order to strengthen the market for Liberty Bonds, Secretary McAdoo launched a series of nationwide campaigns. Huge rallies were held in which famous actors, such as Charlie Chaplin, urged the crowds to buy Liberty Bonds. The government also enlisted famous artists to draw posters urging people to purchase the bonds. One of these posters, which are widely sought by collectors, is shown below.



Louis Raemaekers. After a Zeppelin Raid in London: "But Mother Had Done Nothing Wrong, Had She, Daddy?" Prevent this in New York: Invest in Liberty Bonds. 19 x 12." From the Rutgers University Library Collection of Liberty Bond Posters.

Although the campaigns may have improved the morale of both the armed forces and the people at home, how much the campaigns contributed to expanding the market for the bonds is an open question. The bonds were tax-exempt – the exact degree of exemption varied from issue to issue – and this undoubtedly made them attractive to investors in high tax brackets. Indeed, the Treasury was criticized for imposing high marginal taxes with one hand, and then creating a loophole with the other. The Federal Reserve also bought many of the bonds creating new money. Some of this new "highpowered money" augmented the reserves of the commercial banks which allowed them to buy bonds or to finance their purchase by private citizens. Thus, directly or indirectly, a good deal of the support for the bond market was the result of money creation rather than savings by the general public.

Table 3 provides a rough breakdown of the means used to finance the war. Of the total cost of the war, about 22 percent was financed by taxes and from 20 to 25 percent by printing money, which meant that from 53 to 58 percent was financed through the bond issues.

Table 3
Financing World War I, March 1917-May 1919

Source of finance	Billions of Dollars	Percent (M2)	Percent (M4)
Taxation and nontax receipts	7.3	22	22
Borrowing from the public	24	58	53
Direct money creation	1.6	5	5
Indirect money creation (M2)	4.8	15	
Indirect money creation (M4)	6.6		20
Total cost of the war	32.9	100	100

Note: Direct money creation is the increase in the stock of high-powered money net of the increase in monetary gold. Indirect money creation is the increase in monetary liabilities not matched by the increase in high-powered money.

Source: Friedman and Schwartz (1963, 221)

Heavy reliance on the Federal Reserve meant, of course, that the stock of money increased rapidly. As shown in Table 1, the stock of money rose from $20.7 billion in 1916 to $35.1 billion in 1920, about 70 percent. The price level (GDP deflator) increased 85 percent over the same period.

The Government's Role in Mobilization

Once the contracts for munitions were issued and the money began flowing, the government might have relied on the price system to allocate resources. This was the policy followed during the Civil War. For a number of reasons, however, the government attempted to manage the allocation of resources from Washington. For one thing, the Wilson administration, reflecting the Progressive wing of the Democratic Party, was suspicious of the market, and doubted its ability to work quickly and efficiently, and to protect the average person against profiteering. Another factor was simply that the European belligerents had adopted wide-ranging economic controls and it made sense for the United States, a latecomer, to follow suit.

A wide variety of agencies were created to control the economy during the mobilization. A look at four of the most important – (1) the Food Administration, (2) the Fuel Administration, (3) the Railroad Administration, and (4) the War Industries Board – will suggest the extent to which the United States

turned away from its traditional reliance on the market. Unfortunately, space precludes a review of many of the other agencies such as the War Shipping Board, which built noncombatant ships, the War Labor Board, which attempted to settle labor disputes, and the New Issues Committee, which vetted private issues of stocks and bonds.

Food Administration

The Food Administration was created by the Lever Food and Fuel Act in August 1917. Herbert Hoover, who had already won international fame as a relief administrator in China and Europe, was appointed to head it. The mission of the Food Administration was to stimulate the production of food and assure a fair distribution among American civilians, the armed forces, and the Allies, and at a fair price. The Food Administration did not attempt to set maximum prices at retail or (with the exception of sugar) to ration food. The Act itself set what then was a high minimum price for wheat – the key grain in international markets – at the farm gate, although the price would eventually go higher. The markups of processors and distributors were controlled by licensing them and threatening to take their licenses away if they did not cooperate. The Food Administration then attempted control prices and quantities at retail through calls for voluntary cooperation. Millers were encouraged to tie the sale of wheat flour to the sale of less desirable flours – corn meal, potato flour, and so on – thus making a virtue out of a practice that would have been regarded as a disreputable evasion of formal price ceilings. Bakers were encouraged to bake "Victory bread," which included a wheat-flour substitute. Finally, Hoover urged Americans to curtail their consumption of the most valuable foodstuffs: there were, for example, Meatless Mondays and Wheatless Wednesdays.

Fuel Administration

The Fuel Administration was created under the same Act as the Food Administration. Harry Garfield, the son of President James Garfield, and the President of Williams College, was appointed to head it. Its main problem was controlling the price and distribution of bituminous coal. In the winter of 1918 a variety of factors combined to cause a severe coal shortage that forced school and factory closures. The Fuel Administration set the price of coal at the mines and the margins of dealers, mediated disputes in the coalfields, and worked with the Railroad Administration (described below) to reduce long hauls of coal.

Railroad Administration

The Wilson Administration nationalized the railroads and put them under the control of the Railroad Administration in December of 1917, in response to severe congestion in the railway network that was holding up the movement of war goods and coal. Wilson's energetic Secretary of the Treasury (and son-in-law), William Gibbs McAdoo, was appointed to head it. The railroads would remain under government control for another 26 months. There has been considerable controversy over how well the system worked under federal control. Defenders of the takeover point out that the congestion was relieved and that policies that increased standardization and eliminated unnecessary competition were put in place. Critics of the takeover point to the large deficit that was incurred, nearly $1.7 billion, and to the deterioration of the capital stock of the industry. William J. Cunningham's (1921) two papers in the *Quarterly Journal of Economics*, although written shortly after the event, still provide one of the most detailed and fair-minded treatments of the Railroad Administration.

War Industries Board

The most important federal agency, at least in terms of the scope of its mission, was the War Industries

Board. The Board was established in July of 1917. Its purpose was no less than to assure the full mobilization of the nation's resources for the purpose of winning the war. Initially the Board relied on persuasion to make its orders effective, but rising criticism of the pace of mobilization, and the problems with coal and transport in the winter of 1918, led to a strengthening of its role. In March 1918 the Board was reorganized, and Wilson placed Bernard Baruch, a Wall Street investor, in charge. Baruch installed a "priorities system" to determine the order in which contracts could be filled by manufacturers. Contracts rated AA by the War Industries Board had to be filled before contracts rated A, and so on. Although much hailed at the time, this system proved inadequate when tried in World War II. The War Industries Board also set prices of industrial products such as iron and steel, coke, rubber, and so on. This was handled by the Board's independent Price Fixing Committee.

It is tempting to look at these experiments for clues on how the economy would perform under various forms of economic control. It is important, however, to keep in mind that these were very brief experiments. When the war ended in November 1918 most of the agencies immediately wound up their activities. Only the Railroad Administration and the War Shipping Board continued to operate. The War Industries Board, for example, was in operation only for a total of sixteen months; Bernard Baruch's tenure was only eight months. Obviously only limited conclusions can be drawn from these experiments.

Costs of the War

The human and economic costs of the war were substantial. The death rate was high: 48,909 members of the armed forces died in battle, and 63,523 died from disease. Many of those who died from disease, perhaps 40,000, died from pneumonia during the influenza-pneumonia epidemic that hit at the end of the war. Some 230,074 members of the armed forces suffered nonmortal wounds.

John Maurice Clark provided what is still the most detailed and thoughtful estimate of the cost of the war; a total amount of about $32 billion. Clark tried to estimate what an economist would call the resource cost of the war. For that reason he included actual federal government spending on the Army and Navy, the amount of foreign obligations, and the difference between what government employees could earn in the private sector and what they actually earned. He excluded interest on the national debt and part of the subsidies paid to the Railroad Administration because he thought they were transfers. His estimate of $32 billion amounted to about 46 percent of GNP in 1918.

Long-run Economic Consequences

The war left a number of economic legacies. Here we will briefly describe three of the most important.

The finances of the federal government were permanently altered by the war. It is true that the tax increases put in place during the war were scaled back during the 1920s by successive Republican administrations. Tax rates, however, had to remain higher than before the war to pay for higher expenditures due mainly to interest on the national debt and veterans benefits.

The international economic position of the United States was permanently altered by the war. The United States had long been a debtor country. The United States emerged from the war, however, as a net creditor. The turnaround was dramatic. In 1914 U.S investments abroad amounted to $5.0 billion, while total foreign investments in the United States amounted to $7.2 billion. Americans were net *debtors* to the tune of $2.2 billion. By 1919 U.S investments abroad had risen to $9.7 billion, while total foreign investments in the United States had fallen to $3.3 billion: Americans were net *creditors* to the tune of $6.4 billion.[7] Before the war the center of the world capital market was London, and the Bank of

England was the world's most important financial institution; after the war leadership shifted to New York, and the role of the Federal Reserve was enhanced.

The management of the war economy by a phalanx of Federal agencies persuaded many Americans that the government could play an important positive role in the economy. This lesson remained dormant during the 1920s, but came to life when the United States faced the Great Depression. Both the general idea of fighting the Depression by creating federal agencies and many of the specific agencies and programs reflected precedents set in Word War I. The Civilian Conservation Corps, a Depression era agency that hired young men to work on conservation projects, for example, attempted to achieve the benefits of military training in a civilian setting. The National Industrial Recovery Act reflected ideas Bernard Baruch developed at the War Industries Board, and the Agricultural Adjustment Administration hearkened back to the Food Administration. Ideas about the appropriate role of the federal government in the economy, in other words, may have been the most important economic legacy of American involvement in World War I.

Chronology of World War I

1914	
June	Archduke Franz Ferdinand is shot.
August	Beginning of the war.
1915	
May	Sinking of the *Lusitania*. War talk begins in the United States.
1916	
June	National Defense Act expands the Army
1917	
February	Germany renews unrestricted submarine warfare.
	U.S.S. Housatonic sunk.
	U.S. breaks diplomatic relations with Germany
April	U.S. declares war.
May	Selective Service Act
June	First Liberty Loan
July	War Industries Board
August	Lever Food and Fuel Control Act
October	War Revenue Act
November	Second Liberty Loan
December	Railroads are nationalized.
1918	
January	Maximum prices for steel
March	Bernard Baruch heads the War Industries Board
	Germans begin massive offensive on the western front
May	Third Liberty Loan
	First independent action by the American Expeditionary Force
June	Battle of Belleau Wood – the first sizable U.S. action
July	Second Battle of the Marne – German offensive stopped
September	900,000 Americans in the Battle of Meuse-Argonne

October Fourth Liberty Loan
November Armistice

References and Suggestions for Further Reading

Ayres, Leonard P. *The War with Germany: A Statistical Summary*. Washington DC: Government Printing Office. 1919.

Balke, Nathan S. and Robert J. Gordon. "The Estimation of Prewar Gross National Product: Methodology and New Evidence." *Journal of Political Economy* 97, no. 1 (1989): 38-92.

Clark, John Maurice. "The Basis of War-Time Collectivism." *American Economic Review* 7 (1917): 772-790.

Clark, John Maurice. *The Cost of the World War to the American People*. New Haven: Yale University Press for the Carnegie Endowment for International Peace, 1931.

Cuff, Robert D. *The War Industries Board: Business-Government Relations during World War I. Baltimore: Johns Hopkins University Press, 1973.*

Cunningham, William J. "The Railroads under Government Operation. I: The Period to the Close of 1918." *Quarterly Journal of Economics* 35, no. 2 (1921): 288-340. "II: From January 1, 1919, to March 1, 1920." *Quarterly Journal of Economics* 36, no. 1. (1921): 30-71.

Friedman, Milton, and Anna J. Schwartz. *A Monetary History of the United States, 1867-1960*. Princeton: Princeton University Press, 1963.

Friedman, Milton, and Anna J. Schwartz. *Monetary Statistics of the United States: Estimates, Sources, and Methods. New York: Columbia University Press, 1970.*

Gilbert, Martin. *The First World War: A Complete History*. New York: Henry Holt, 1994.

Kendrick, John W. *Productivity Trends in the United States. Princeton: Princeton University Press, 1961.*

Koistinen, Paul A. C. *Mobilizing for Modern War: The Political Economy of American Warfare, 1865-1919*. Lawrence, KS: University Press of Kansas, 1997.

Miron, Jeffrey A. and Christina D. Romer. "A New Monthly Index of Industrial Production, 1884-1940." *Journal of Economic History* 50, no. 2 (1990): 321-37.

Rockoff, Hugh. *Drastic Measures: A History of Wage and Price Controls in the United States*. New York: Cambridge University Press, 1984.

Rockoff, Hugh. "Until It's Over, Over There: The U.S. Economy in World War I." National Bureau of Economic Research, Working Paper w10580, 2004.

U.S. Bureau of the Census. *Historical Statistics of the United States, Colonial Times to 1970, Bicentennial Edition*. Washington, DC: Government Printing Office, 1975.

Endnotes

[1] Quoted in Gilbert (1994, 3).

[2] U.S. exports to Europe are from U.S. Bureau of the Census (1975), series U324.

[3] Real wages in manufacturing were computed by dividing "Hourly Earnings in Manufacturing Industries" by the Consumer Price Index (U.S. Bureau of the Census 1975, series D766 and E135).

[4] Steel ingots are from the National Bureau of Economic Research, macrohistory database, series m01135a, www.nber.org. Total Industrial Production is from Miron and Romer (1990), Table 2.

[5] The sharp and temporary drop in the winter of 1918 was due to a shortage of coal.

[6] The chart shows end-of-month values of the S&P/Cowles Composite Stock Index, from Global Financial Data: http://www.globalfinancialdata.com/. To get real prices I divided this index by monthly values of the United States Consumer Price Index for all items. This is available as series 04128 in the National Bureau of Economic Research Macro-Data Base available at http://www.nber.org/.

[7] U.S. investments abroad (U.S. Bureau of the Census 1975, series U26); Foreign investments in the U.S. (U.S.

Citation: Rockoff, Hugh. "US Economy in World War I". EH.Net Encyclopedia, edited by Robert Whaples. February 10, 2008. URL http://eh.net/encyclopedia/u-s-economy-in-world-war-i/

The Panic of 1907

Jon Moen, University of Mississippi

The Panic of 1907 was the last and most severe of the bank panics that plagued the National Banking Era of the United States. Severe panics also happened in 1873, 1884, 1890, and 1893, although numerous other smaller financial crises cropped up from time to time. Bank panics were characterized by the widespread appearance of bank runs, attempts by depositors to simultaneously withdraw their deposits from the banking system. Because banks did not (and still do not) keep a 100% reserve against deposits, it paid to be near the front of the line of depositors demanding their money when a panic blew up. What sets 1907 apart from earlier panics was that the crisis focused on the trusts companies in New York City. The National Banking Era lasted from 1863 to 1914, when Congress, in part to eliminate these recurring panics, created the Federal Reserve System.

What Caused the Panic?

Why would a panic happen? One answer that is really not of much help is that all depositors suddenly became so concerned about the solvency or liquidity of their bank that they decided they would rather hold cash than deposits (Diamond and Dybvig 1983; Jacklin and Bhattacharya 1988). (Solvency refers to the relationship between assets and liabilities; an insolvent bank has liabilities greater than its assets. Liquidity refers to the ease with which assets can be converted to cash without loss of value; liquid assets are close to cash or have a market in which they can be easily and quickly sold.) Whatever the deeper psychological reasons might be, it is not hard to identify some immediate shocks to depositor confidence that sparked the Panic of 1907. Such a shock occurred on October 16, 1907, when F. Augustus Heinze's scheme to corner the stock of United Copper Company failed. Although United Copper was only a moderately important firm, the collapse of Heinze's scheme, exposed an intricate network of interlocking directorates across banks, brokerage houses, and trust companies in New York City. Contemporary observers like O.M.W. Sprague (1910) believed that the discovery of the close associations

between bankers and stockbrokers seriously raised the anxiety of already nervous depositors.

During the National Banking Era the New York money market faced seasonal variations in interest rates and liquidity resulting from the transportation of crops from the interior of the United States to New York and then to Europe. The outflow of capital necessary to finance crop shipments from the Midwest to the East Coast in September or October usually left the New York City money market squeezed for cash. As a result, short-term interest rates in New York City were prone to spike upward in autumn. Seasonal increases in economic activity were not matched by an increase in the money supply because existing domestic monetary structures tended to make the money supply "inelastic." Usually gold would flow into the United States from Europe in response to the high seasonal interest rates, increasing the monetary base of the United States and easing the liquidity squeeze somewhat.

Under more normal financial conditions, the discovery of a scheme like Heinze's might not have sparked a panic, but conditions were not normal in the Fall of 1907. The economy had been slowing, the stock market had been in decline since early 1907, and the supply of credit had been contracting causing rising interest rates. Tight credit markets in Europe, particularly in England where the Bank of England had been raising its bank rate since December 1906, have been implicated in setting an especially precarious financial stage in 1907. Therefore, the normal seasonal inflows of foreign gold were not happening in 1907 as European interest rates rose. Because there was no central bank or reliable lender of last resort during the National Banking Era, there was no reliable way to expand the money supply in the United States.

Heinze's extensive involvement in New York banking was subsequently linked to one of his close and suspicious associates, C.F. Morse. Morse controlled three national banks directly and was a director of four other banks. After the failure of his attempt to corner United Copper stock, Heinze was forced to resign from the presidency of Mercantile National Bank, and worried depositors began a run on the bank. Depositors began runs on several of the banks controlled by Morse as well. The New York Clearinghouse, a private organization formed by banks to centralize check clearing (a check clears when it is finally presented to the bank on which it was originally written for payment in cash or reserves), had its examiner analyze the banks' assets. On the basis of the examination, the Clearinghouse authorities stated that they would support Mercantile and the other banks on the condition that Heinze and Morse retire from banking in New York. On Monday, October 21, Mercantile National resumed business with new management, and the runs on these national banks ceased.

The Panic at the Trust Companies

By October 21, nothing resembling a systemic panic, however, had yet stricken the New York banking system. Depositors at Mercantile Bank withdrew funds but redeposited them in other New York City banks. Many accounts of the Panic of 1907 cite Monday, October 21, as the beginning of the crisis among the trust companies and the true onset of the panic. Late that Monday afternoon the National Bank of Commerce announced that it would stop clearing checks for the Knickerbocker Trust Company, the third largest trust in New York City. Vincent Carosso (1987), however, suggests that the run on Knickerbocker began Friday, October 18, when Charles Barney, the Knickerbocker president, was reported to have been involved in Heinze's copper corner. Drawing from the private papers of J.P. Morgan, Carosso notes that the National Bank of Commerce had been extending loans to the Knickerbocker Trust to hold off depositor runs. National Bank of Commerce's refusal to continue acting as a clearing agent for Knickerbocker was interpreted as a vote of no confidence that seriously alarmed Knickerbocker depositors.

On Monday evening, October 21, J.P. Morgan organized a meeting of trust company executives to discuss ways to halt the panic. Morgan, along with James Stillman of National City Bank and George Baker of First National Bank, had earlier organized an informal team to oversee relief efforts during the panic at the national banks (Carosso 1987). Assisting them were several young financial experts responsible for evaluating the assets of troubled institutions and indicating which ones were worthy of aid. Chief among these investigators was Benjamin Strong of Banker's Trust Company, who would later become president of the Federal Reserve Bank of New York. Strong reported to Morgan that he was unable to evaluate Knickerbocker's financial condition in the short time before funds would have to be committed. Unwilling to act on limited information, Morgan decided not to aid the trust; this decision kept other institutions from offering substantial aid as well. It appears that at first Morgan was uninterested in aiding the trust companies in general, as he felt they should pay for their risky behavior. It is not clear that they were riskier; perhaps Morgan just did not want to aid intermediaries competing with the banks. On October 22 Knickerbocker underwent a run for three hours before suspending operations just after noon, having paid out $8 million in cash.

Ominously, next to the front-page article describing the run on the Knickerbocker Trust in the Wednesday, October 23, edition of the New York Times was a headline describing the Trust Company of America, the second largest trust company in New York City, as the current "sore point" in the panic. By attracting attention to the Trust Company of America, the newspaper article greatly exacerbated the serious run on it. Barney, who was president of Knickerbocker, was also a member of the board of directors of Trust Company of America.

On Tuesday, October 22, withdrawals from Trust Company of America were approximately $1.5 million; on the Wednesday when the ill-timed article was published depositors claimed another $13 million of nearly $60 million in total deposits. Withdrawals from Trust Company of America on Thursday, October 24, were a further $8 million to $9 million. During the span of the run, which lasted two weeks, Trust Company of America reportedly paid out $47.5 million in deposits.

Saving the Trusts

Realizing that the failure of Trust Company of America and Lincoln Trust, another trust company whose distress had been publicized, would endanger the New York money market, five leading trust company presidents formed a committee to assist trusts needing cash. Not all trusts were willing to cooperate, however, so the committee was not able to collect enough cash to provide reliable relief for a trust company facing a sudden run. They petitioned Morgan for more help.

Morgan, Baker, and Stillman knew that aid for Trust Company of America was not certain and saw that the collapse of several large trusts would be disastrous. Strong had arrived at Trust Company of America sometime after 2:00 A.M. Wednesday and had begun to appraise its assets. That afternoon he reported to Morgan that Trust Company was basically sound and deserved assistance. Morgan channeled about $3 million to Trust Company just before closing time, which allowed it to resume business the next day.

Aid began to come from several other sources. J.D. Rockefeller deposited $10 million with the Union Trust to help the trusts and announced his support for Morgan. Secretary of the Treasury George Cortelyou and the major New York financiers met on the evening of Wednesday, October 23, and discussed plans to combat the crisis. Cortelyou deposited $25 million of the Treasury's funds in national banks the following morning. Between October 21 and October 31, the Treasury deposited a total of $37.6 million in New York national banks and provided $36 million in small bills to meet runs. By the

middle of November, however, the U.S. Treasury's working capital had dwindled to $5 million. Thus Treasury could not and did not contribute much more aid during the rest of the panic (Timberlake 1978, 1993).

The Connection to the Stock Market

Meanwhile, by Thursday, October 24, call money on the New York Stock Exchange was nearly unobtainable. Call money was money lent for the purchase of stock equity, with the stock itself serving as collateral for the loans. Call loans could be called in at any time. The opening rate for call money was 6 percent, but exchange president Ransom H. Thomas noticed a serious scarcity of money. At one point that morning a bid of 60 percent went out for call money. Yet, even at that exorbitant rate, no money was offered. The last recorded transaction of the day was at the opening rate of 6 percent. Fearing a total collapse of the stock market, Thomas called Stillman for aid. Stillman referred Thomas to Morgan, who was in control of most of the available funds. While Thomas traveled to Morgan's office, the call money rate on the exchange reached 100 percent.

On October 25 another money pool was required. About $10 million came from the Morgan group, $2 million from First National, and $500,000 from Kuhn, Loeb, and Company. This time, however, Morgan allowed the market to determine the call money rate, which remained at nearly 50 percent most of the day. The Morgan funds had restrictions designed to stifle speculation. First, no margin sales were allowed-only cash sales for investment. Also, the full amount of Morgan money was not released until afternoon. Throughout the stock exchange crisis, both Trust Company of America and Lincoln Trust were supported by Morgan's efforts. The Trust Company of America and Lincoln Trust required further aid, and Morgan convinced other trust presidents to support a $25 million loan for the troubled institutions. The funds were provided on November 4 after several nights of negotiation. The panic began to ease when the trust company presidents organized by Morgan agreed to form a consortium to support trust companies facing runs.

The most severe runs on deposits in New York City were limited to the trust companies, not the state or national banks. Deposits contracted at all the trusts in New York, not just the prominent ones like Knickerbocker (Moen and Tallman 1992). This raises a question. If only the trust companies were being run by depositors, why would the banks want to help their competitors? The stock market provides a key link. Runs on deposits forced trusts to liquidate their most liquid assets, call loans on the stock market. Large-scale liquidation of call loans depressed the value of stocks because the stock serving as collateral for the call loan had to be sold quickly to pay off the loan. The sudden increase in the supply of stock would depress stock prices. Given the predominance of national banks in the call loan market, extensive liquidation of call loans by trusts threatened the assets of national banks. National banks and the clearinghouse were aware that they were economically linked to the trust companies through the call loan market. They realized that runs on the trusts could spread to the national banks through the call loan market, giving the banks a strong financial incentive to help the trusts stop the panic, even if they had no legal interest.

The New York Clearinghouse Association Steps In

While financiers were working out the crises with the trusts and the call loan market, money and reserves had become increasingly tight at banks. On October 26 the Clearinghouse issued clearinghouse loan certificates as an artificial mechanism to increase the supply of currency available to the public, a tactic it had used in earlier financial crises in 1873 and 1893 (Timberlake 1984; Gorton 1985; Tallman 1988).

Although the national banking system offered no legal mechanism to increase the supply of currency quickly, loan certificates provided an informal (if unlawful) way to free up a sizable amount of cash. In normal business banks used currency as reserve assets and as the medium to clear accounts with each other. Clearinghouse loan certificates enabled banks to convert their noncash assets into cash during a crisis: banks would substitute loan certificates for currency in their clearings, thus releasing the currency to pay depositors who demanded cash. In effect, loan certificates were IOUs between banks that were backed by eligible assets of the bank. Loan certificates were not recognized as currency by the public or by depositors, and they could legally circulate only among banks, not the public. A. Piatt Andrew (1908) noted, however, that during the 1907 Panic, a number of substitutes for cash were employed in transactions.

Following the first issue of clearinghouse loan certificates on October 26 during the 1907 Panic, loans initially increased by about $11 million. During the next three weeks more than $110 million in certificates were issued in New York City. Over the entire course of the Panic, nearly $500 million in currency substitutes circulated throughout the country as a "principal means of payment," according to Andrew (1910, 515). Sprague has criticized the clearinghouse for delaying the use of loan certificates until after the panic was well under way. He believed that issuing certificates as soon as the crisis struck the trusts would have calmed the market by allowing banks to accommodate their depositors more quickly. Aid would have gone directly to troubled banks and trusts, and the cumbersome device of money pools could have been avoided. Fewer loans would have been called in, thus reducing the tension at the stock exchange (Sprague 1910, 257-58).

The clearinghouse also restricted the convertibility of demand deposits into cash — an action, which, like issuing loan certificates to the public, was illegal. The restriction, referred to as "suspension of payments," increased the costs of doing business by making payments more difficult. Nevertheless, banks continued other business activities such as accepting deposits and clearing checks. The suspension of payments spread across the country through the system of correspondent banks. Although convertibility was widely restored by the beginning of January, in a few instances loan certificates and other substitutes for cash circulated as late as March 1908.

Why Were There Runs on Trust Companies?

There were three main types of financial intermediaries during the National Banking Era: national banks, state banks, and later in the period trust companies. It is not surprising that trust companies were the focal point of the panic. In New York, assets at the trust companies had grown phenomenally between 1890 and 1910, increasing 244 percent during the 10 years ending in 1907, from $396.7 million to $1,394.0 million. In contrast, national bank assets had grown 97 percent, from $915.2 million to $1,800.0 million, while state-chartered bank assets had grown 82 percent, from $297 million to $541.0 million (Barnett 1911, 234-35). Thus the manner in which trust companies used their assets greatly affected the New York money market (Moen and Tallman 1992).

Trust companies were much less regulated than national or state banks in New York. In 1906 New York State instituted a requirement that trusts maintain reserves at 15 percent of deposits, but only 5 percent of deposits needed to be kept as currency in the vault. Before that time trusts simply kept whatever reserves they felt necessary to conduct business. National bank notes were adequate as cash reserves for trusts while national banks in central reserve cities like New York were required to keep a 25 percent reserve in the form of specie or legal tender (greenbacks or treasury notes but not national bank notes).

Trusts were originally rather conservative institutions, managing estates, holding securities, and taking deposits, but by 1907 trusts were performing most of the functions of banks except issuing bank notes. Many of the larger trusts specialized in underwriting security issues. Others wrote mortgages or invested directly in real estate activities barred or limited for national banks. New York City trusts had a higher proportion of collateralized loans than did New York City national banks. Conventional banking wisdom associated collateralized loans with riskier investments and riskier borrowers. The trusts, therefore, had an asset portfolio that may have been riskier than those of other intermediaries.

National and private banks found the investment banking functions of trusts so useful that many of them gained direct or indirect control of a trust through holding companies or by placing their associates on a trust's board of directors. In many instances a bank and its affiliated trust operated in the same building.

Trusts appear to have provided intermediary functions different from those of banks. Although the volume of deposits subject to check at trusts was similar to that at banks, trusts had many fewer checks (in number and value) written against their demand deposits than did banks. The check clearings of trusts were only about 7 percent of the volume of those at banks. Trusts were not then like commercial banks, whose assets are used as transactions balances by individual depositors or firms. National banks were part of a network of regional banks that had correspondent relationships to expedite interregional transactions (James 1978, 40). Trusts were not part of the correspondent banking system, so their deposits were more local and less directly subject to the recurring seasonal strains on funds.

Conclusion

The New York Clearinghouse had detailed knowledge of the quality of bank assets in New York. A similar, formal organization of trust companies would have had current knowledge of the assets and liabilities of its member trusts. Such an organization could have more readily assessed the situation at trust companies facing runs than the ad hoc consortiums and money pools organized by Morgan. The ability of a clearinghouse to shield its members from runs on deposits was clearly demonstrated by the Chicago Clearinghouse in 1907, where there were virtually no runs on deposits. In Chicago the trust companies, similar in structure to those in New York, were members of the clearinghouse and were not singled out by depositors. A lender of last resort covering all intermediaries in the payments system certainly adds stability to the system. JP Morgan and others, however, may have profited from earlier panics by lending money to otherwise desperate bankers. This is the popular view of their actions in 1907. The 1907 Panic, however, may have turned out to be far more severe than anticipated. Even if Morgan made money after the fact in 1907, the expectation of higher default risk made the possibility of lending in future panics unattractive. Perhaps this is what was realized by the New York bankers, causing them to abandon their role as de facto lenders of last resort and setting the groundwork for the establishment of the Federal Reserve System.

References:

Much of this article is based on a review article from the Federal Reserve Bank of Atlanta, although I have updated some of our economic interpretations of the panic, particularly on matters related to liquidity and solvency. The complete reference to the review article is:

Moen, Jon and Ellis Tallman. "Lessons from the Panic of 1907." *Federal Reserve Bank of Atlanta Economic Review* 75 (May/June 1990): 2-13.

Other important references cited or used are:

Andrew, A. Piatt. "Substitutes for Cash in the Panic of 1907." *Quarterly Journal of Economics* 23, (August 1908): 497-516.

Barnett, George E. *State Banks and Trust Companies since the Passage of the National Bank Act*. Washington, D.C.: U.S. Government Printing Office, 1911.

Calomiris, Charles and Gary Gorton. "The Origins of Bank Panics: Models, Facts, and Bank Regulations." In *Financial Markets and Financial Crises*, edited by R. Glenn Hubbard. Chicago: University of Chicago Press, 1991.

Carosso, Vincent P. *The Morgans: Private International Bankers, 1854-1913*. Cambridge, MA: Harvard University Press, 1987.

The Commercial and Financial Chronicle. Various issues from November 7, 1907 through January 8, 1908.

Diamond, Douglas W., and Philip H. Dybvig. "Bank Runs, Deposit Insurance, and Liquidity." *Journal of Political Economy* 91 (June 1983): 401-19.

Friedman, Milton, and Anna 1. Schwartz. *A Monetary History of the United States: 1867-1960*. Princeton, N.J.: Princeton University Press, 1963.

Gorton, Gary. "Clearinghouses and the Origins of Central Banking in the United States." *Journal of Economic History* 45 (June 1985): 277-84.

Jacklin, Charles J., and Sudipto Bhattacharya. "Distinguishing Panics and Information-Based Bank Runs: Welfare and Policy Implications." *Journal of Political Economy* 96 (June 1988): 568-92.

James, John. *Money and Capital Markets in Postbellum America*. Princeton, NJ: Princeton University Press, 1978.

Moen, Jon, and Ellis W. Tallman. "The Bank Panic of 1907: The Role of the Trust Companies." *Journal of Economic History* 52 (September 1992): 611-630.

Moen, Jon, and Ellis W. Tallman "Clearinghouse Membership and Deposit Contraction during the Panic of 1907." *Journal of Economic History* 60 (March 2000): 145-163.

Sprague, Oliver M.W. "The American Crisis of 1907." *The Economic Journal* 18 (September 1908): 353-72.

Sprague, Oliver M.W. *History of Crises under the National Banking System*. National Monetary Commission. Washington, D.C.: U.S. Government Printing Office, 1910.

Tallman, Ellis W. "Some Unanswered Questions about Banking Panics." *Federal Reserve Bank of Atlanta Economic Review* 73 (November/December 1988): 2-21.

Timberlake, Richard Henry. *The Origins of Central Banking in the United States*. Cambridge, MA: Harvard University Press, 1978.

Timberlake, Richard Henry. *Monetary Policy in the United States*. Chicago: University of Chicago Press, 1993.

Timberlake, Richard Henry. "The Central Banking Role of Clearinghouse Associations." *Journal of Money, Credit and Banking* 16 (February 1984): 1-15.

Citation: *Moen, Jon. "Panic of 1907 . EH.Net Encyclopedia, edited by Robert Whaples. August 14, 2001. URL http://eh.net/encyclopedia/the-panic-of-1907/*

Economic Recovery in the Great Depression

Frank G. Steindl, Oklahoma State University

Introduction

The Great Depression has two meanings. One is the horrendous debacle of 1929-33 during which unemployment rose from 3 to 25 percent as the nation's output fell over 25 percent and prices over 30 percent, in what also has been called the Great Contraction. A second meaning has the Great Depression as the entire decade of the thirties, the anxieties and apprehensions for which John Steinbeck's *The Grapes of Wrath* is a metaphor. Much has been written about the unprecedented drop in economic activity in the Great Contraction, with questions about its causes and the reasons for its protracted decline especially prominent. The amount of scholarship devoted to these issues dwarfs that dealing with the recovery. But there indeed was a recovery, though long, tortuous, and uneven. In fact, it was well over twice as long as the contraction.

The economy hit its trough in March 1933. Whether or not by coincidence, President Franklin D. Roosevelt took office that month, initiating the New Deal and its fabled first hundred days, among which was the creation in June 1933 of its principal recovery vehicle, the NIRA — National Industrial Recovery Act.

Facts of the Recovery

Figure 1 uses monthly data. This allows us to see more finely the movements of the economy, as contrasted with the use of quarterly or annual data. For present purposes, the decade of the Depression runs from August 1929, when the economy was at its business cycle peak, through March 1933, the contraction trough, to June 1942, when the economy clearly was back to it long-run high-employment trend.

Figure 1 depicts the behavior of industrial output and prices over the Great Depression decade, the former as measured by the Index of Industrial Employment and the latter by the Wholesale Price Index.[1] Among the notable features are the large declines in output and prices in the Great Contraction, with the former falling 52 percent and the latter 37 percent. Another noteworthy feature is the sharp, severe 1937-38 depression, when in twelve months output fell 33 percent and prices 11 percent. A third feature is the over-two-year deflation in the face of a robust increase in output following the 1937-38 depression.

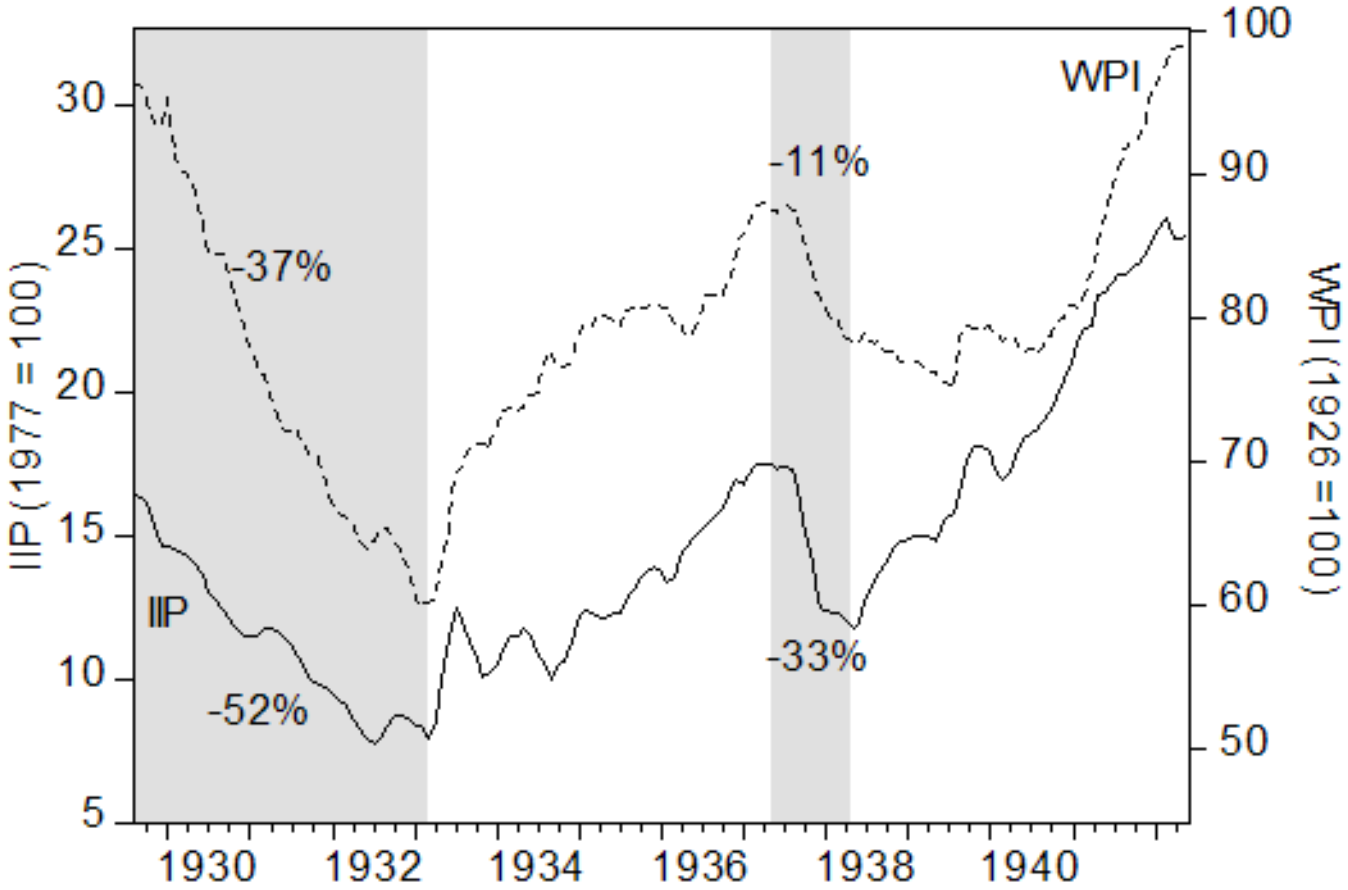


Figure 1. Industrial Production and Wholesale Prices, August 1929–June 1942

The behavior of the unemployment rate is shown in Figure 2.[2] The dashed line shows the reported official data, which do not count as employed those holding "temporary" relief jobs. The solid line adjusts the official series by including those holding such temporary jobs as employed, the effect of which is to reduce the unemployment rate (Darby 1976). Each series rises from around 3 to about 23 percent between 1929 and 1932. The official series then climbs to near 25 percent the following year whereas the adjusted series is over four percentage points lower. Each continues declining the rest of the recovery, though both rise sharply in 1938. By 1940, each is still in double digits.

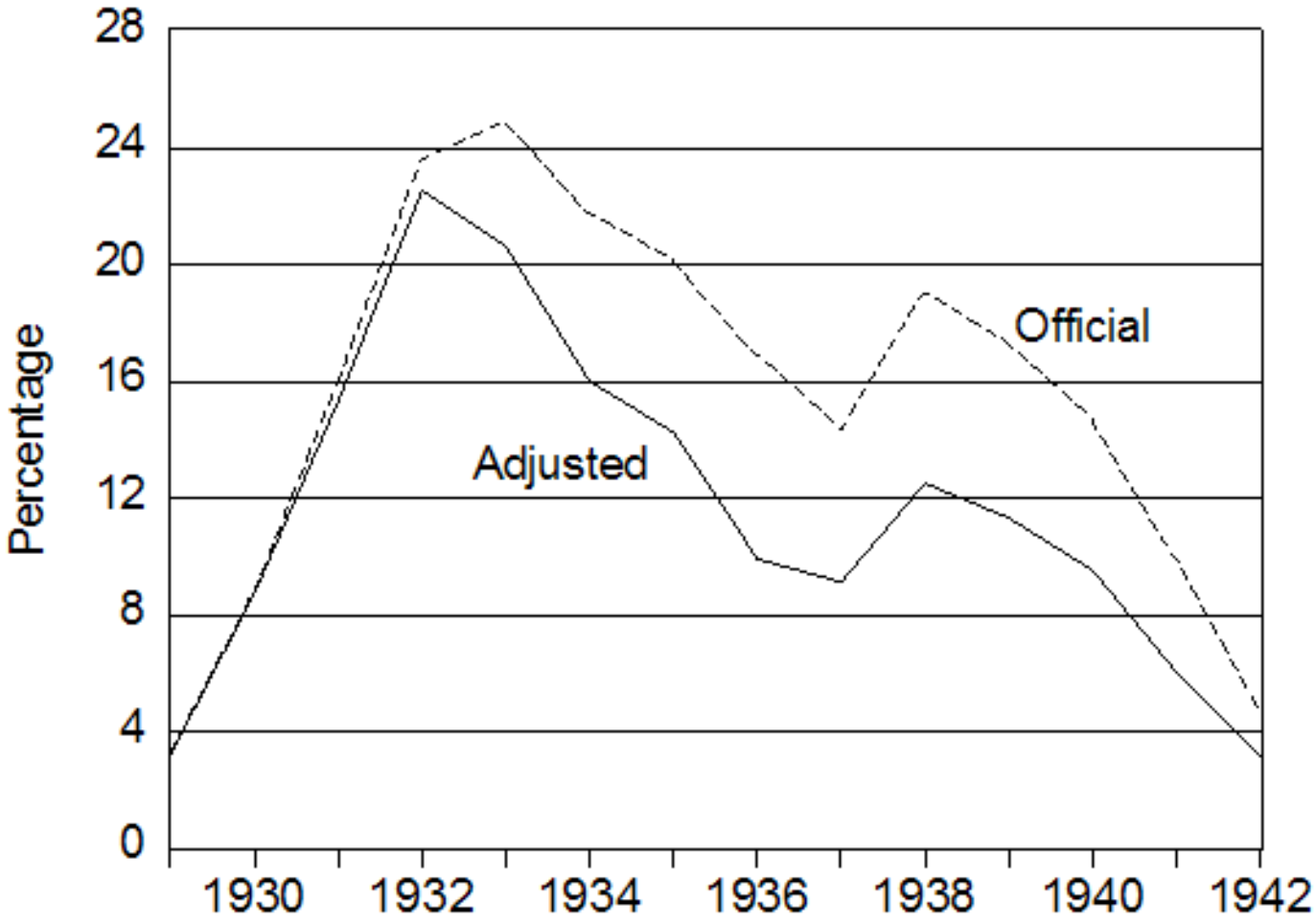


Figure 2. Unemployment rate, official and adjusted 1929-42

Three other charts that are helpful for understanding the recovery are Figures 3, 4, and 5. The first of these shows that the *monetary base* of the economy — which is the reserves of commercial banks plus currency held by the public — grew principally through increases in the stock of gold In contrast to the normal situation, the base did not increase because of credit provided by the Federal Reserve System. Such credit was essentially constant. That is, the Fed, the nation's central bank, was basically passive for most of the recovery. The rise in the stock of gold occurred initially because of revaluation of gold from $20.67 to $35 an ounce in 1933-34 (which though not changing the physical holdings of gold raised the value of such holdings by 69 percent). The physical stock of gold now valued at the higher price then increased because of an inflow of gold principally from Europe due to the deteriorating political and economic situation there.

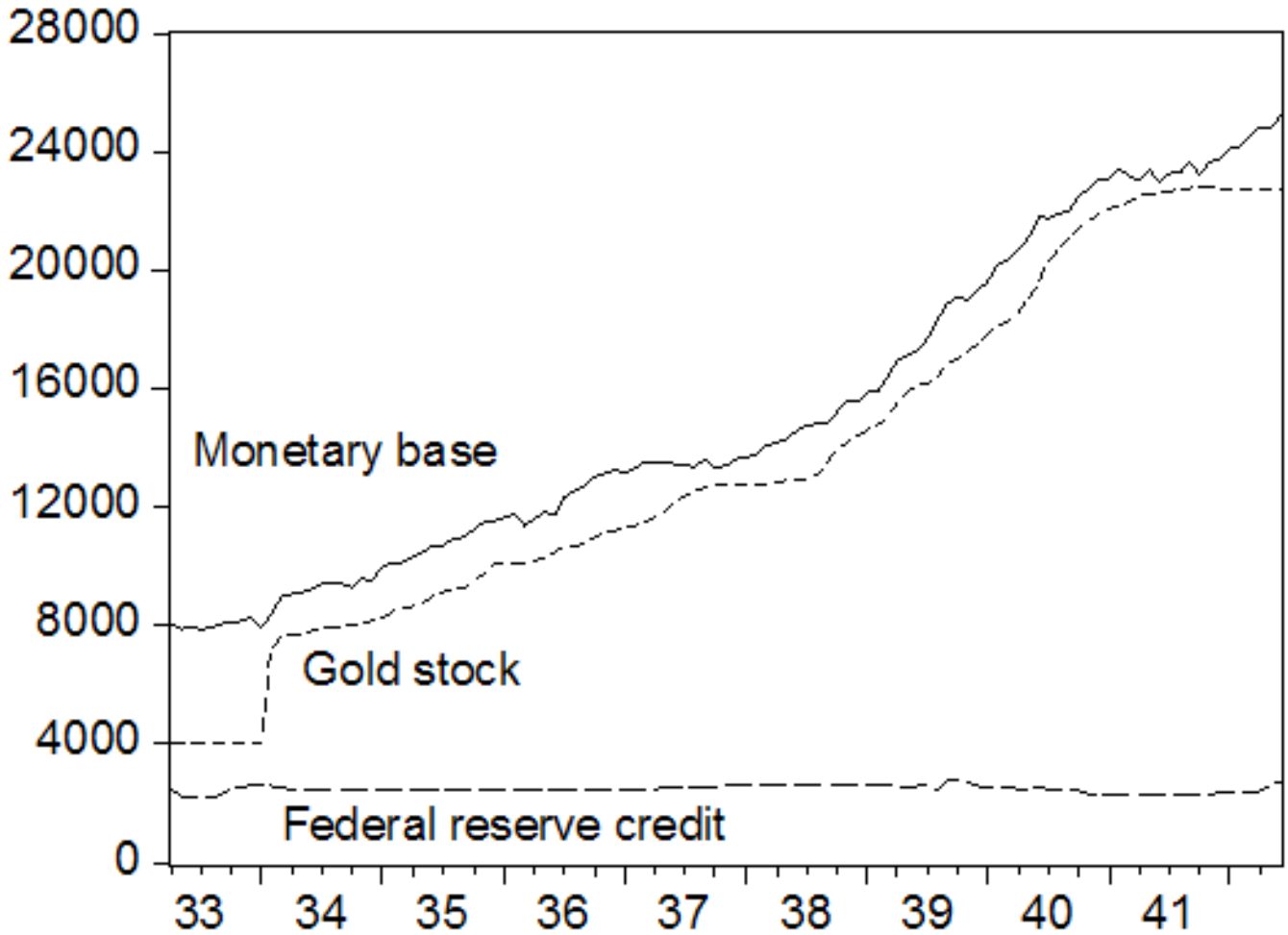


Figure 3. Monetary base, Gold, and Federal reserve credit (millions), April 1933-June 1942

Figure 4 shows the behavior of the stock of money, both the narrow *M1*and broader *M2* measures of it. The shaded area shows the decreases in those money stocks in the 1937-38 depression. Those declines were one of the reasons for that depression, just as the large declines in the money stock in 1929-33 were major factors responsible for the Great Contraction. During the Contraction of 1929-33, the narrow measure of the money stock — currency held by the public and demand deposits, *M1* — fell 28 percent and the broader measure of it (*M1* plus time deposits at commercial banks) fell 35 percent. These declines were major factors in causing the sharp decline that was the debacle of 1929-33.

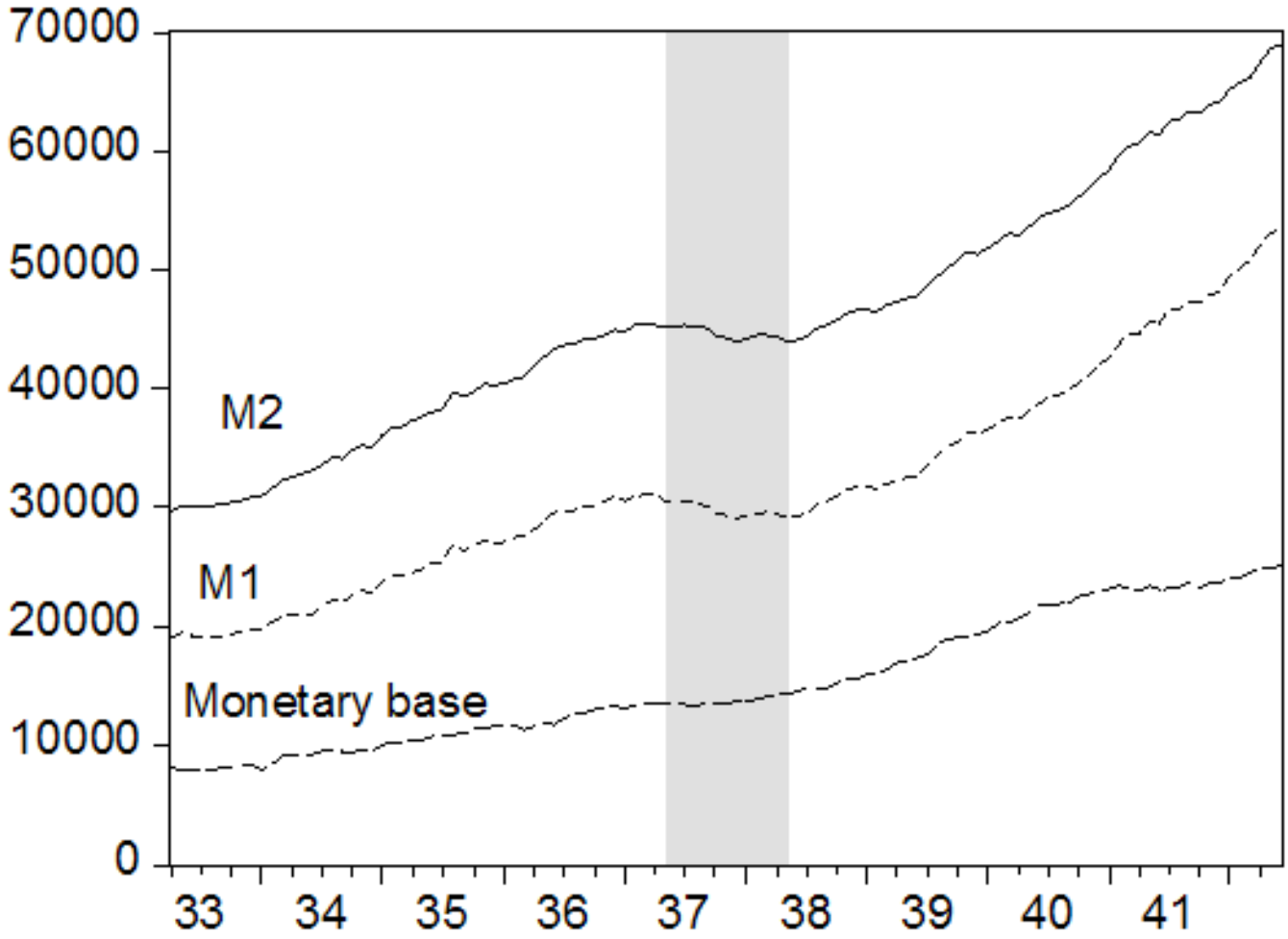


Figure 4. Money stocks and monetary base (millions)
April 1933-June 1942

Lastly, the budget position of the federal government is shown in Figure 5. One of the notable features is the sharp increase in expenditures in mid-1936 and the equally sharp decrease thereafter. The budget therefore went dramatically into deficit, and then began to move toward a surplus by the end of 1936, largely due to the tax revenues arising from the Social Security Act of 1935.

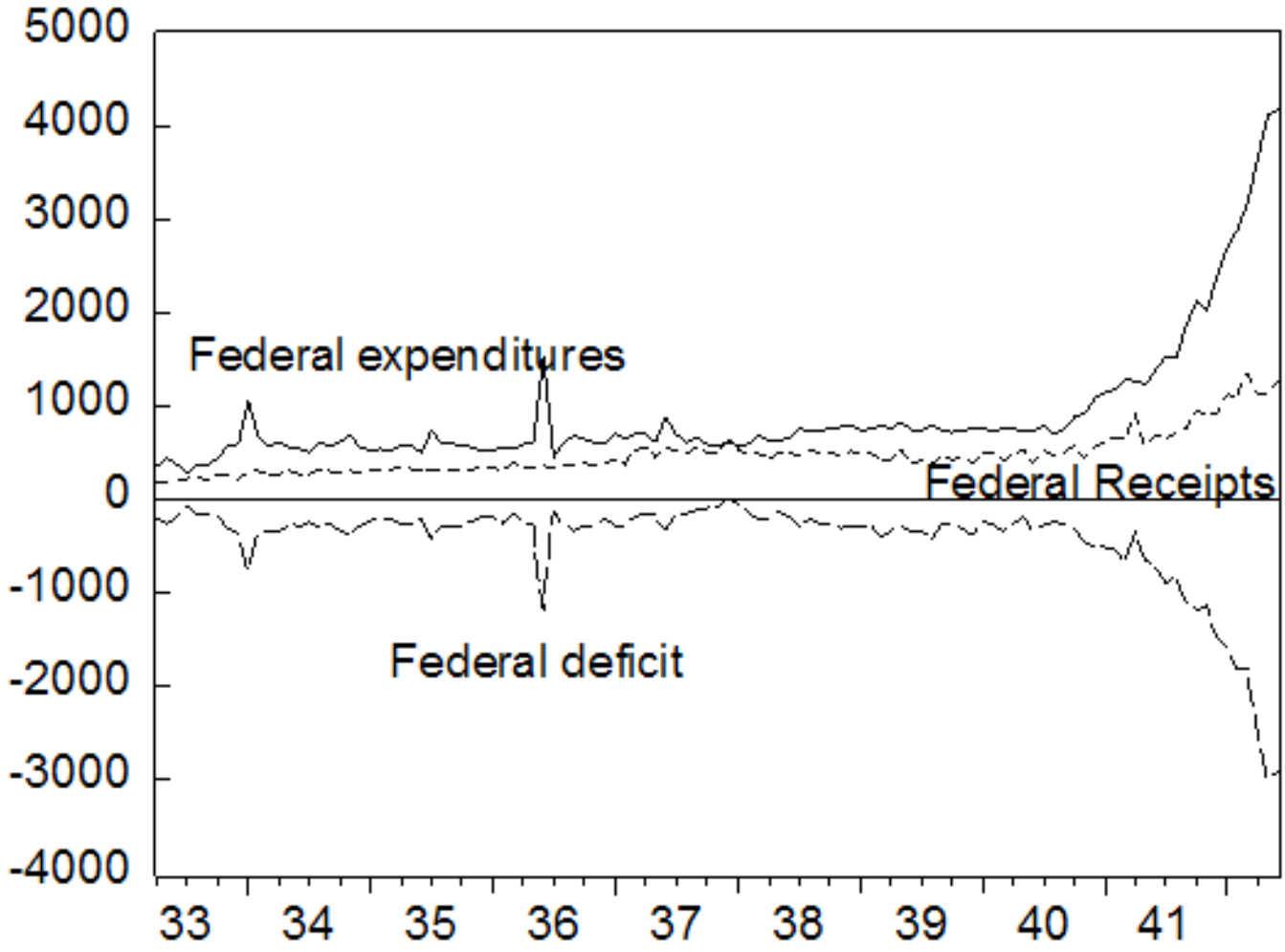


Figure 5. Federal government expenditures, receipts, and deficit (millions), April 1933-June 1942

Reasons for Recovery

In *Golden Fetters* (1992), Barry Eichengreen advanced the basis for the most widely accepted understanding of the slide and recovery of economies in the 1930s. The depression was a worldwide phenomenon, as indicated in Figure 6, which shows the behavior of industrial production for several major countries. His basic thesis related to the gold standard and the manner in which countries altered their behavior under it during the 1930s. Under the classical "rules of the game," countries experiencing balance of payments deficits financed those deficits by exporting gold. The loss of gold forced them to contract their money stock, which then resulted in deflationary pressures. Countries running balance of payments surpluses received gold, which expanded their money stocks, thereby inducing expansionary pressures. According to Eichengreen's framework, countries did not "play by the rules" of the international gold standard during the depression era. Rather, countries losing gold were forced to contract. Those receiving gold, however, did not expand. This generated a net deflationary bias, as a result of which the depression was world wide for those countries on the gold standard. As countries *cut their ties to gold*, which the U.S. did in early 1933, they were free to pursue expansionary monetary and fiscal policies, and this is the principal reason underlying the recovery. The inflow of gold into the U.S., for instance, expanded the reserves of the banking system, which became the basis for the increases in the stock of money.

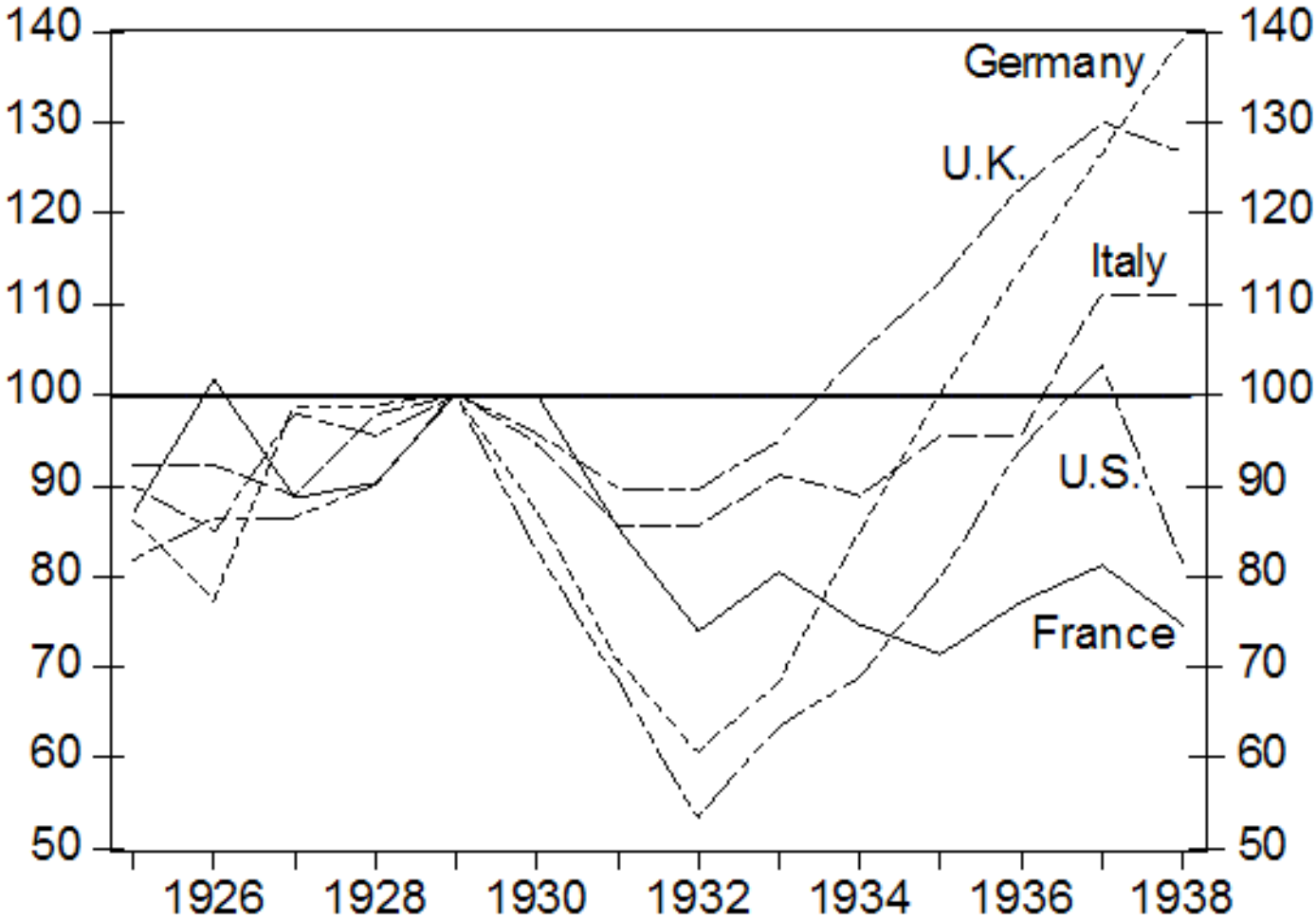


Figure 6. International industrial production, 1929 = 100

The quantity theory of money is a useful framework that can be used to understand movements of prices and output. The theory holds that increases in the supply of money relative to the demand results in increased spending on goods, services, financial assets, and real capital. The theory can be expressed in the following equation, where *M* is the stock of money, *V* is velocity, the rate at which it is spent, which is the mirror side of the demand for money — the desire to hold it. *P* is the price level and *y* is real output.

$$MV = Py$$

Increases in *M* relative to *V* result in increases in *P* and *y*.

Research into the forces of recovery generally concludes that the growth of the money supply (*M*) was the principal cause of the rise in output (*y*) after March 1933, the trough of the Great Contraction. Furthermore, those increases in the money stock also pushed up the price level (*P*).

Four studies expressly dealing with the recovery are of note. Milton Friedman and Anna Schwartz show that "the broad movements in the stock of money correspond with those in income" (1963, 497) and argue that "the rapid rate of rise in the money stock certainly promoted and facilitated the concurrent economic expansion" (1963, 544). Christina Romer concludes that the growth of the money stock was "crucial to the recovery. If [it] had been held to its normal level, the U.S. economy in 1942 would have been 50 percent below its pre-Depression trend path" (1992, 768-69). She also finds that fiscal policy "contributed almost nothing to the recovery" (1992, 767), a finding that mirrors much of the postwar

research on the influence of fiscal policy, and stands in contrast to the views of much of the public as it came to believe that the fiscal budget deficits of President Roosevelt were fundamental in promoting recovery.[3]

Ben Bernanke (1995) similarly stresses the importance of the growth of the money stock as basic to the recovery. He focuses on the gold standard as a restraint on independent monetary actions, finding that "the evidence is that countries leaving the gold standard recovered substantially more rapidly and vigorously than those who did not" (1995, 12) because they "had greater freedom to initiate expansionary monetary policies" (1995, 15).

More recently Allan Meltzer (2003) finds the recovery driven by increases in the stock of money, based on an expanding monetary base due to gold. "The main policy stimulus to output came from the rise in money, an unplanned consequence of the 1934 devaluation of the dollar against gold. Later in the decade the rising threat of war, and war itself supplemented the $35 gold price as a cause of the rise in gold and money" (2003, 573).

That the recovery was due principally to the growth of the stock of money appears to be a robust conclusion of postwar research into causes of the 1930s recovery.

The manner in which the stock of money increased is important. The growing stock of gold increased the reserves of banks, hence the monetary base. With their greater reserves, banks did two things. First, they held some as precautionary reserves, called excess reserves. This is measured on the left hand side of Figure 7. Secondly, they bought U.S.government securities, more than tripling their holdings, as seen on the right hand axis of Figure 7. Also, as seen there, commercial bank loans increased only slightly in the recovery, rising only 25 percent in over nine years.[4] The principal impetus to the growth of the money stock, therefore, was banks' increased purchases of U.S. government securities, both ones already outstanding and ones issued to finance the deficits of those years.

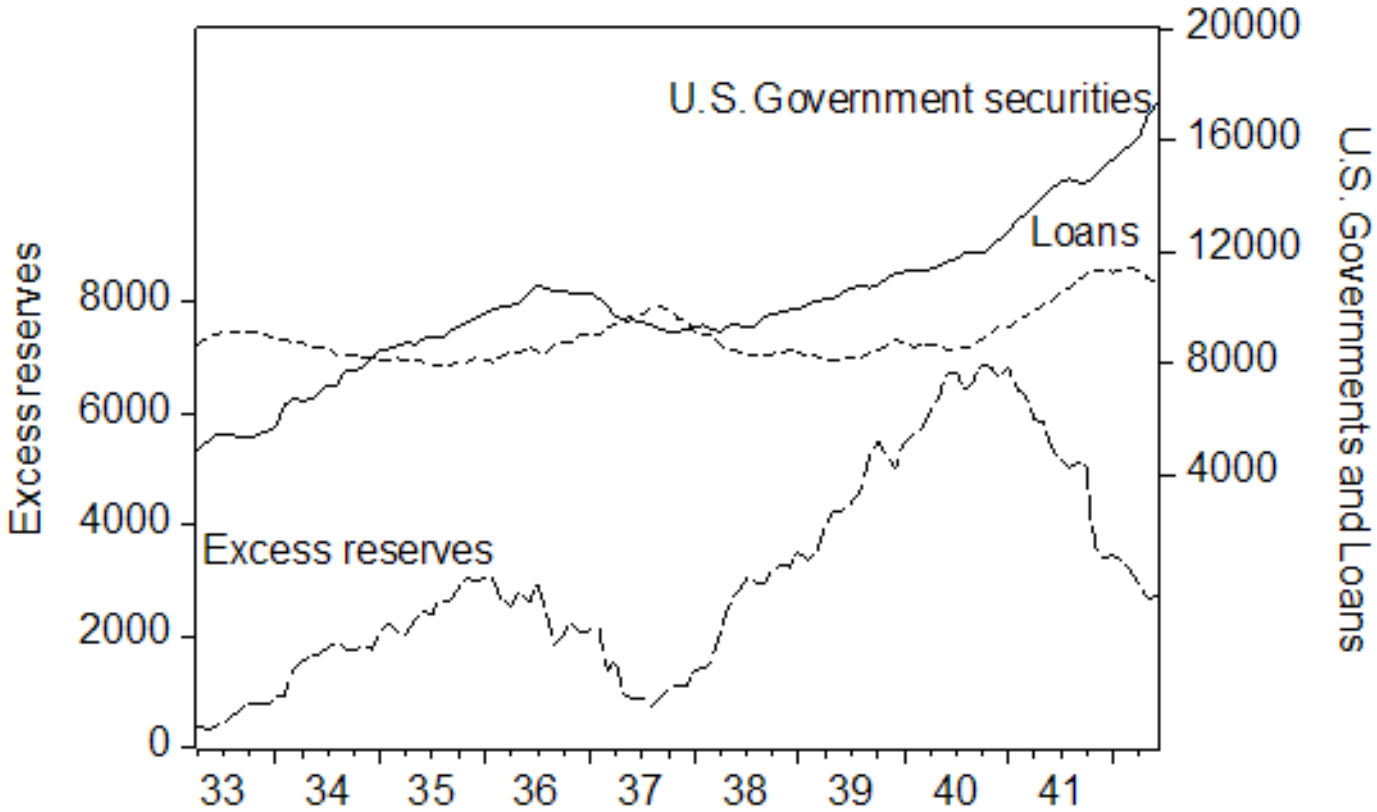


Figure 7. Excess reserves, U.S. government securities, and Loans, U.S. Commercial Banks (millions) April 1933-June 1942

The 1937-38 Depression and Revival

After four years of recovery, the economy plunged into a deep depression in May 1937, as output fell 33 percent and prices 11 percent in twelve months (shown in Figure 1). Two developments were identified with being principally responsible for the depression.[5] The one most prominently identified by contemporary scholars is the action of the Federal Reserve.

As the Fed saw the volume of excess reserves climbing month after month, it became concerned about the potential inflationary consequences if banks were to begin making more loans, thereby expanding the money supply and driving up prices. The Banking Act of 1935 gave the Fed authority to change reserve requirements. With its newly granted authority, it decided upon a "preemptive strike" against what it regarded as incipient inflation. Because it thought that those excess reserves were due to a "shortage of borrowers," it therefore raised reserve requirements, the effect of which was to impound in required reserves the former excess reserves. The increased requirements were in fact doubled, in three steps: August 1936, March 1937, and May 1937. As Figure 7 exhibits, excess reserves therefore fell. The principal effect of the doubling of reserve requirements was to reduce the stock of money, as shown in the shaded area of Figure 4.[6]

A second factor causing the depression was the falling federal budget deficit, due to two considerations. First, there was a sharp one-time rise in expenditures in mid-1936, due to the payment of a World War I Veterans' Bonus. Thereafter, expenditures fell — the "spike" in the figure. Secondly, the Social Security Act of 1935 mandated collection of payroll taxes beginning in 1937, with the first payments to be made several years later. The joint effect of these two was to move the budget to near surplus by late 1937.

During the depression, both output and prices fell, as was their usual behavior in depressions. The

bottom of the depression was May 1938, one year after it began. Thereafter, output began growing quite robustly, rising 58 percent by August 1940. Prices, however, continued to fall, for over two years. Figure 8 shows the depression and revival experience from May 1937 through August 1940, the month in which prices last fell. The two shaded areas are the year-long depression and the price "spike" in September 1939. Of interest is that the shock of the war that spurred the price jump did not induce expectations of further price rises. Prices continued to fall for another year, through August 1940.

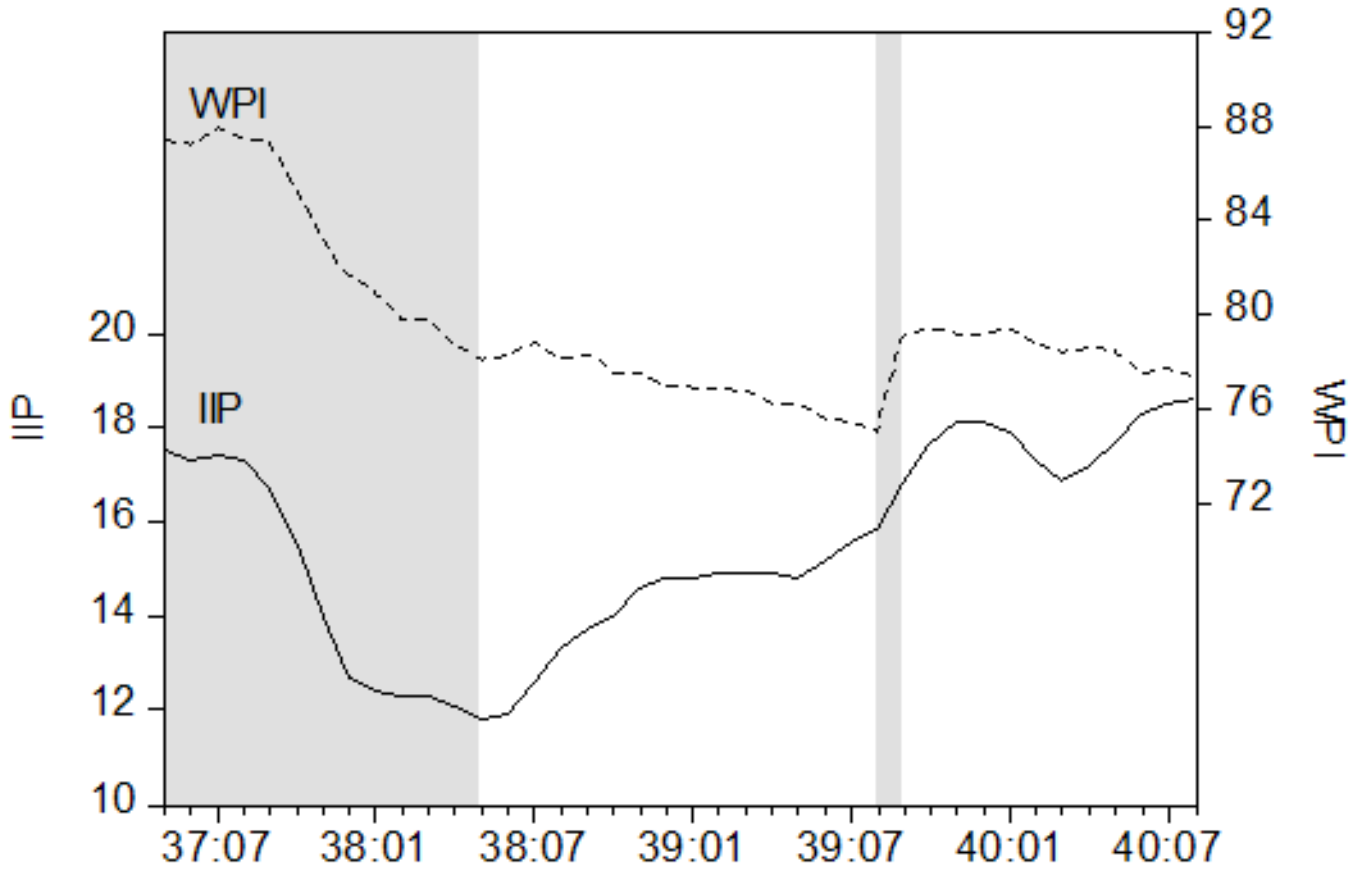


Figure 8. Output and prices in the 1937-38 depression and deflationary revival May 1937-August 1940

Difficulties with Current Understanding

According to the currently accepted interpretation, the recovery owes its existence to increases in the stock of money. One difficulty with this view is the marked contrast to the price experience of recovery through mid-1937. How could rising prices in the 1933 turnaround be fundamental to the recovery but not in the vigorous, later recovery, when prices actually fell? Another difficulty is that the continued rise in the stock of money is due to the political turmoil in Europe. There is little intrinsic to the U.S economy that contributed. Presumably, had there been no continuing inflow of gold raising the monetary base and money stock, the economy would have languished until the demands of World War II would have made their impact. In other words, would there have been virtually no recovery had there been no Adolf Hitler?

Of more consequence is the conundrum presented by the experience of more than two years of deflation in the face of dramatically rising aggregate demand, of which the sharply rising money stock appears as a major force. If the rising stock of money were fundamental to the recovery, then prices and

output would have been rising, as the aggregate demand for output, spurred also by increasing fiscal budget deficits, would have been increasing relative to aggregate supply. But in the present instance, prices were declining, not rising. Something else was driving the economy during the *entire* recovery, but the seemingly dominant aggregate demand pressures obscured it in the early part.

One prospective impetus to aggregate supply would be declining real wages that would spur the hiring of additional workers. But with prices declining, it is unlikely that real wages would have fallen in the revival from the late 1930s depression. The evidence as indicated in Figure 9 shows that they in fact increased. With few exceptions, real wages increased throughout the entire deflationary period, rising 18 percent overall and 6 percent in the revival. The real wage rate, by rising, was thus a detriment to increased supply. Real wages cannot therefore be a factor inducing greater aggregate supply.

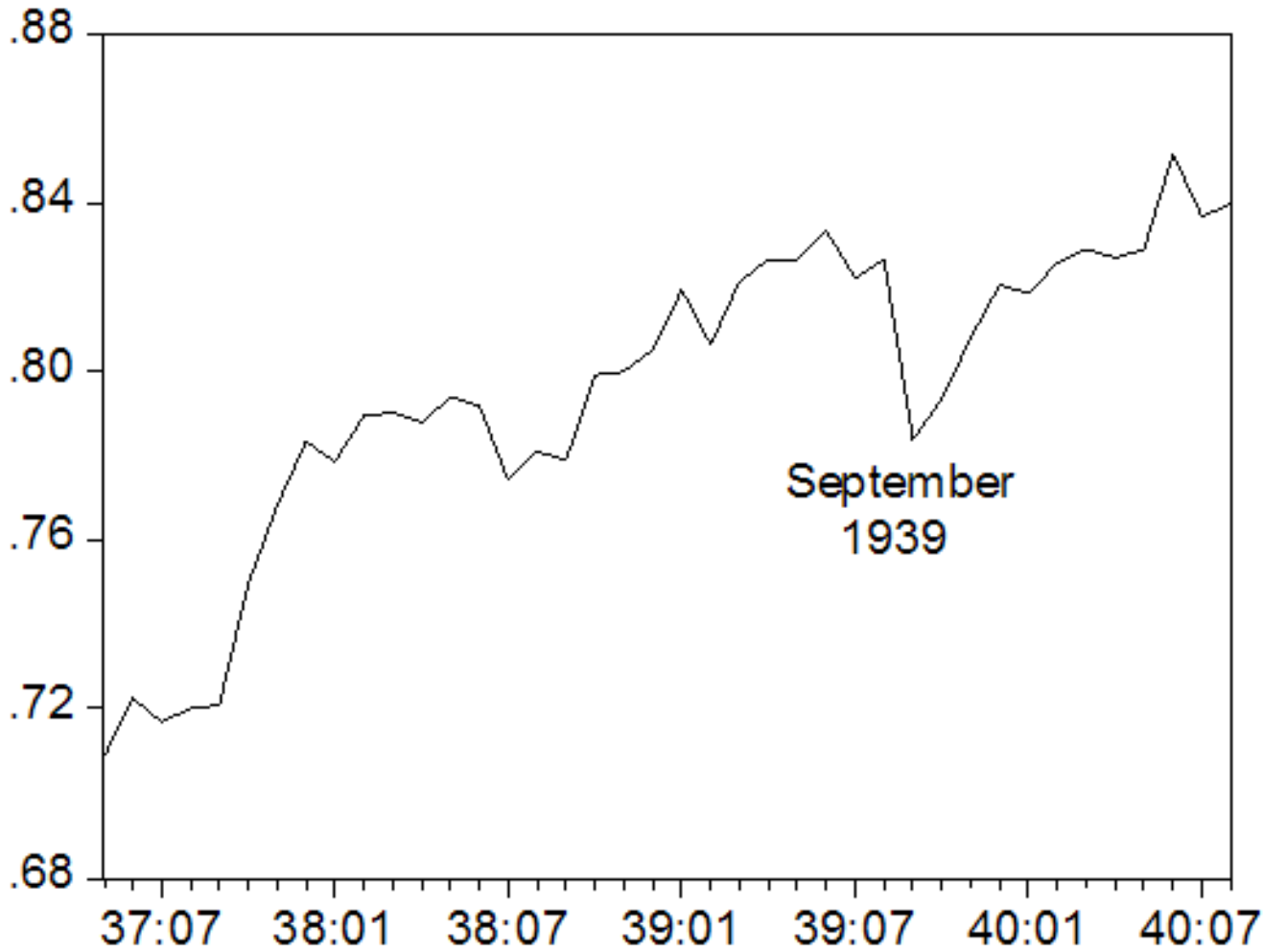


Figure 9. Real wages in 1926 dollar (dollars per hour)
May 1937-August 1940

The economic phenomenon that was driving the recovery was probably increasing productivity. An early indication of this comes from the pioneering work of Robert Solow (1957) who in the course of examining factors contributing to economic growth developed data on the behavior of productivity. In support of this, Alexander Field presents both macroeconomic and microeconomic evidence showing that "the years 1929-41 were, in the aggregate, the most technologically progressive of any comparable period in U.S. economic history" (2003, 1399).

The rapid productivity increases were an important factor explaining the seemingly anomalous problem of rapid recovery and the stubbornness of the unemployment rate. In today's parlance, this has come to

be known as a "jobless recovery," one in which rising productivity generates increased output rather than greater labor input producing more.

To acknowledge that productivity increases were crucial to the economic recovery is not however the end of the story because we are still left trying to understand the mechanisms underlying their sharp increases. What induced such increases? Serendipity — the idea that productivity increased at just the right time and in the appropriate amounts — is not an appealing explanation.

More likely, there is something intrinsic to the economy that encapsulates mechanisms — that is, incentives spurring inventive capital and labor innovations generating productivity increases, as well as other factors — that move the economy back to its potential.

References

Bernanke, Ben S. "The Macroeconomics of the Great Depression: A Comparative Approach." *Journal of Money, Credit, and Banking* 27 (1995): 1-28.

Darby, Michael R. "Three-and-a-Half Million U.S. Employees Have Been Mislaid: Or an Explanation of Unemployment, 1934-41." *Journal of Political Economy* 84 (1976):1-16.

Eichengreen, Barry. *Golden Fetters: The Gold Standard and the Great Depression 1919-1939*. New York: Oxford University Press, 1992.

Field, Alexander J. "The Most Technologically Progressive Decade of the Century." *American Economic Review* 93 2003): 1399-1413.

Friedman, Milton and Anna J. Schwartz. *A Monetary History of the United States: 1867-1960*. Princeton, NJ: Princeton University Press, 1963.

Meltzer, Allan H. *A History of the Federal Reserve, volume 1, 1913-1951*. Chicago: University of Chicago Press, 2003.

Romer, Christina D. "What Ended the Great Depression?" *Journal of Economic History* 52 (1992): 757-84.

Solow, Robert M. "Technical Change and the Aggregate Production Function." *Review of Economics and Statistics* 39 (1957): 312-20.

Smithies, Arthur. "The American Economy in the Thirties." *American Economic Review Papers and Proceedings* 36 (1946):11-27.

Steindl, Frank G. *Understanding Economic Recovery in the 1930s: Endogenous Propagation in the Great Depression*. Ann Arbor: University of Michigan Press, 2004.

---

[1] Industrial production and the nation's real output, real GDP, are highly correlated. The correlation relation is 98 percent, both for quarterly and annual data over the recovery period

[2] Data on the unemployment rate are available only on an annual basis for the Depression decade.

[3] In fact, large numbers of academics held that view, of which Arthur Smithies' address to the American Economic Association is an example. His assessment was that "My main conclusion … is that fiscal policy did prove to be … the *only* effective means to recovery" (1946, 25, emphasis added).

[4] Real loans — loans relative to the price level — in fact declined, falling 24 percent in the 111 months

of recovery.

[5] A third factor was the action of the U.S. Treasury as it "sterilized" gold, at the instigation of the Federal Reserve. By sterilization of gold, the Treasury prevented the gold inflows from increasing bank reserves.

[6] The reason the stock of money fell is that banks responded to the increased reserve requirements by trying to rebuild their excess reserves. That is, the banks did not regard their excess reserves as surplus reserves, but rather as precautionary reserves. This contrasted with the Federal Reserve's view that the excess reserves were surplus ones, due to a "shortage" of borrowers at banks.

Citation: Steindl, Frank. "Economic Recovery in the Great Depression". EH.Net Encyclopedia, edited by Robert Whaples. March 16, 2008. URL http://eh.net/encyclopedia/economic-recovery-in-the-great-depression/

An Overview of the Great Depression

Randall Parker, East Carolina University

This article provides an overview of selected events and economic explanations of the interwar era. What follows is not intended to be a detailed and exhaustive review of the literature on the Great Depression, or of any one theory in particular. Rather, it will attempt to describe the "big picture" events and topics of interest. For the reader who wishes more extensive analysis and detail, references to additional materials are also included.

The 1920s

The Great Depression, and the economic catastrophe that it was, is perhaps properly scaled in reference to the decade that preceded it, the 1920s. By conventional macroeconomic measures, this was a decade of brisk economic growth in the United States. Perhaps the moniker "the roaring twenties" summarizes this period most succinctly. The disruptions and shocking nature of World War I had been survived and it was felt the United States was entering a "new era." In January 1920, the Federal Reserve seasonally adjusted index of industrial production, a standard measure of aggregate economic activity, stood at 81 (1935–39 = 100). When the index peaked in July 1929 it was at 114, for a growth rate of 40.6 percent over this period. Similar rates of growth over the 1920–29 period equal to 47.3 percent and 42.4 percent are computed using annual real gross national product data from Balke and Gordon (1986) and Romer (1988), respectively. Further computations using the Balke and Gordon (1986) data indicate an average annual growth rate of real GNP over the 1920–29 period equal to 4.6 percent. In addition, the relative international economic strength of this country was clearly displayed by the fact that nearly one-half of world industrial output in 1925–29 was produced in the United States (Bernanke, 1983).

Consumer Durables Market

The decade of the 1920s also saw major innovations in the consumption behavior of households. The development of installment credit over this period led to substantial growth in the consumer durables market (Bernanke, 1983). Purchases of automobiles, refrigerators, radios and other such durable goods

all experienced explosive growth during the 1920s as small borrowers, particularly households and unincorporated businesses, utilized their access to available credit (Persons, 1930; Bernanke, 1983; Soule, 1947).

Economic Growth in the 1920s

Economic growth during this period was mitigated only somewhat by three recessions. According to the National Bureau of Economic Research (NBER) business cycle chronology, two of these recessions were from May 1923 through July 1924 and October 1926 through November 1927. Both of these recessions were very mild and unremarkable. In contrast, the 1920s began with a recession lasting 18 months from the peak in January 1920 until the trough of July 1921. Original estimates of real GNP from the Commerce Department showed that real GNP fell 8 percent between 1919 and 1920 and another 7 percent between 1920 and 1921 (Romer, 1988). The behavior of prices contributed to the naming of this recession "the Depression of 1921," as the implicit price deflator for GNP fell 16 percent and the Bureau of Labor Statistics wholesale price index fell 46 percent between 1920 and 1921. Although thought to be severe, Romer (1988) has argued that the so-called "postwar depression" was not as severe as once thought. While the deflation from war-time prices was substantial, revised estimates of real GNP show falls in output of only 1 percent between 1919 and 1920 and 2 percent between 1920 and 1921. Romer (1988) also argues that the behaviors of output and prices are inconsistent with the conventional explanation of the Depression of 1921 being primarily driven by a decline in aggregate demand. Rather, the deflation and the mild recession are better understood as resulting from a decline in aggregate demand together with a series of positive supply shocks, particularly in the production of agricultural goods, and significant decreases in the prices of imported primary commodities. Overall, the upshot is that the growth path of output was hardly impeded by the three minor downturns, so that the decade of the 1920s can properly be viewed economically as a very healthy period.

Fed Policies in the 1920s

Friedman and Schwartz (1963) label the 1920s "the high tide of the Reserve System." As they explain, the Federal Reserve became increasingly confident in the tools of policy and in its knowledge of how to use them properly. The synchronous movements of economic activity and explicit policy actions by the Federal Reserve did not go unnoticed. Taking the next step and concluding there was cause and effect, the Federal Reserve in the 1920s began to use monetary policy as an implement to stabilize business cycle fluctuations. "In retrospect, we can see that this was a major step toward the assumption by government of explicit continuous responsibility for economic stability. As the decade wore on, the System took – and perhaps even more was given – credit for the generally stable conditions that prevailed, and high hopes were placed in the potency of monetary policy as then administered" (Friedman and Schwartz, 1963).

The giving/taking of credit to/by the Federal Reserve has particular value pertaining to the recession of 1920–21. Although suggesting the Federal Reserve probably tightened too much, too late, Friedman and Schwartz (1963) call this episode "the first real trial of the new system of monetary control introduced by the Federal Reserve Act." It is clear from the history of the time that the Federal Reserve felt as though it had successfully passed this test. The data showed that the economy had quickly recovered and brisk growth followed the recession of 1920–21 for the remainder of the decade.

Questionable Lessons "Learned" by the Fed

Moreover, Eichengreen (1992) suggests that the episode of 1920–21 led the Federal Reserve System to

believe that the economy could be successfully deflated or "liquidated" without paying a severe penalty in terms of reduced output. This conclusion, however, proved to be mistaken at the onset of the Depression. As argued by Eichengreen (1992), the Federal Reserve did not appreciate the extent to which the successful deflation could be attributed to the unique circumstances that prevailed during 1920–21. The European economies were still devastated after World War I, so the demand for United States' exports remained strong many years after the War. Moreover, the gold standard was not in operation at the time. Therefore, European countries were not forced to match the deflation initiated in the United States by the Federal Reserve (explained below pertaining to the gold standard hypothesis).

The implication is that the Federal Reserve thought that deflation could be generated with little effect on real economic activity. Therefore, the Federal Reserve was not vigorous in fighting the Great Depression in its initial stages. It viewed the early years of the Depression as another opportunity to successfully liquidate the economy, especially after the perceived speculative excesses of the 1920s. However, the state of the economic world in 1929 was not a duplicate of 1920–21. By 1929, the European economies had recovered and the interwar gold standard was a vehicle for the international transmission of deflation. Deflation in 1929 would not operate as it did in 1920–21. The Federal Reserve failed to understand the economic implications of this change in the international standing of the United States' economy. The result was that the Depression was permitted to spiral out of control and was made much worse than it otherwise would have been had the Federal Reserve not considered it to be a repeat of the 1920–21 recession.

The Beginnings of the Great Depression

In January 1928 the seeds of the Great Depression, whenever they were planted, began to germinate. For it is around this time that two of the most prominent explanations for the depth, length, and worldwide spread of the Depression first came to be manifest. Without any doubt, the economics profession would come to a firm consensus around the idea that the economic events of the Great Depression cannot be properly understood without a solid linkage to both the behavior of the supply of money together with Federal Reserve actions on the one hand and the flawed structure of the interwar gold standard on the other.

It is well documented that many public officials, such as President Herbert Hoover and members of the Federal Reserve System in the latter 1920s, were intent on ending what they perceived to be the speculative excesses that were driving the stock market boom. Moreover, as explained by Hamilton (1987), despite plentiful denials to the contrary, the Federal Reserve assumed the role of "arbiter of security prices." Although there continues to be debate as to whether or not the stock market was overvalued at the time (White, 1990; DeLong and Schleifer, 1991), the main point is that the Federal Reserve believed there to be a speculative bubble in equity values. Hamilton (1987) describes how the Federal Reserve, intending to "pop" the bubble, embarked on a highly contractionary monetary policy in January 1928. Between December 1927 and July 1928 the Federal Reserve conducted $393 million of open market sales of securities so that only $80 million remained in the Open Market account. Buying rates on bankers' acceptances[1] were raised from 3 percent in January 1928 to 4.5 percent by July, reducing Federal Reserve holdings of such bills by $193 million, leaving a total of only $185 million of these bills on balance. Further, the discount rate was increased from 3.5 percent to 5 percent, the highest level since the recession of 1920–21. "In short, in terms of the magnitudes consciously controlled by the Fed, it would be difficult to design a more contractionary policy than that initiated in January 1928" (Hamilton, 1987).

The pressure did not stop there, however. The death of Federal Reserve Bank President Benjamin Strong and the subsequent control of policy ascribed to Adolph Miller of the Federal Reserve Board insured that the fall in the stock market was going to be made a reality. Miller believed the speculative excesses of the stock market were hurting the economy, and the Federal Reserve continued attempting to put an end to this perceived harm (Cecchetti, 1998). The amount of Federal Reserve credit that was being extended to market participants in the form of broker loans became an issue in 1929. The Federal Reserve adamantly discouraged lending that was collateralized by equities. The intentions of the Board of Governors of the Federal Reserve were made clear in a letter dated February 2, 1929 sent to Federal Reserve banks. In part the letter read:

The board has no disposition to assume authority to interfere with the loan practices of member banks so long as they do not involve the Federal reserve banks. It has, however, a grave responsibility whenever there is evidence that member banks are maintaining speculative security loans with the aid of Federal reserve credit. When such is the case the Federal reserve bank becomes either a contributing or a sustaining factor in the current volume of speculative security credit. This is not in harmony with the intent of the Federal Reserve Act, nor is it conducive to the wholesome operation of the banking and credit system of the country. (Board of Governors of the Federal Reserve 1929: 93–94, quoted from Cecchetti, 1998)

The deflationary pressure to stock prices had been applied. It was now a question of when the market would break. Although the effects were not immediate, the wait was not long.

The Economy Stumbles

The NBER business cycle chronology dates the start of the Great Depression in August 1929. For this reason many have said that the Depression started on Main Street and not Wall Street. Be that as it may, the stock market plummeted in October of 1929. The bursting of the speculative bubble had been achieved and the economy was now headed in an ominous direction. The Federal Reserve's seasonally adjusted index of industrial production stood at 114 (1935–39 = 100) in August 1929. By October it had fallen to 110 for a decline of 3.5 percent (annualized percentage decline = 14.7 percent). After the crash, the incipient recession intensified, with the industrial production index falling from 110 in October to 100 in December 1929, or 9 percent (annualized percentage decline = 41 percent). In 1930, the index fell further from 100 in January to 79 in December, or an additional 21percent.

Links between the Crash and the Depression?

While popular history treats the crash and the Depression as one and the same event, economists know that they were not. But there is no doubt that the crash was one of the things that got the ball rolling. Several authors have offered explanations for the linkage between the crash and the recession of 1929–30. Mishkin (1978) argues that the crash and an increase in liabilities led to a deterioration in households' balance sheets. The reduced liquidity[2] led consumers to defer consumption of durable goods and housing and thus contributed to a fall in consumption. Temin (1976) suggests that the fall in stock prices had a negative wealth effect on consumption, but attributes only a minor role to this given that stocks were not a large fraction of total wealth; the stock market in 1929, although falling dramatically, remained above the value it had achieved in early 1928, and the propensity to consume from wealth was small during this period. Romer (1990) provides evidence suggesting that if the stock market were thought to be a predictor of future economic activity, then the crash can rightly be viewed as a source of increased consumer uncertainty that depressed spending on consumer durables and accelerated the

decline that had begun in August 1929. Flacco and Parker (1992) confirm Romer's findings using different data and alternative estimation techniques.

Looking back on the behavior of the economy during the year of 1930, industrial production declined 21 percent, the consumer price index fell 2.6 percent, the supply of high-powered money (that is, the liabilities of the Federal Reserve that are usable as money, consisting of currency in circulation and bank reserves; also called the monetary base) fell 2.8 percent, the nominal supply of money as measured by M1 (the product of the monetary base[3] multiplied by the money multiplier[4]) dipped 3.5 percent and the ex post real interest rate turned out to be 11.3 percent, the highest it had been since the recession of 1920–21 (Hamilton, 1987). In spite of this, when put into historical context, there was no reason to view the downturn of 1929–30 as historically unprecedented. Its magnitude was comparable to that of many recessions that had previously occurred. Perhaps there was justifiable optimism in December 1930 that the economy might even shake off the negative movement and embark on the path to recovery, rather like what had occurred after the recession of 1920–21 (Bernanke, 1983). As we know, the bottom would not come for another 27 months.

The Economy Crumbles

Banking Failures

During 1931, there was a "change in the character of the contraction" (Friedman and Schwartz, 1963). Beginning in October 1930 and lasting until December 1930, the first of a series of banking panics now accompanied the downward spasms of the business cycle. Although bank failures had occurred throughout the 1920s, the magnitude of the failures that occurred in the early 1930s was of a different order altogether (Bernanke, 1983). The absence of any type of deposit insurance resulted in the contagion of the panics being spread to sound financial institutions and not just those on the margin.

Traditional Methods of Combating Bank Runs Not Used

Moreover, institutional arrangements that had existed in the private banking system designed to provide liquidity – to convert assets into cash – to fight bank runs before 1913 were not exercised after the creation of the Federal Reserve System. For example, during the panic of 1907, the effects of the financial upheaval had been contained through a combination of lending activities by private banks, called clearinghouses, and the suspension of deposit convertibility into currency. While not preventing bank runs and the financial panic, their economic impact was lessened to a significant extent by these countermeasures enacted by private banks, as the economy quickly recovered in 1908. The aftermath of the panic of 1907 and the desire to have a central authority to combat the contagion of financial disruptions was one of the factors that led to the establishment of the Federal Reserve System. After the creation of the Federal Reserve, clearinghouse lending and suspension of deposit convertibility by private banks were not undertaken. Believing the Federal Reserve to be the "lender of last resort," it was apparently thought that the responsibility to fight bank runs was the domain of the central bank (Friedman and Schwartz, 1963; Bernanke, 1983). Unfortunately, when the banking panics came in waves and the financial system was collapsing, being the "lender of last resort" was a responsibility that the Federal Reserve either could not or would not assume.

Money Supply Contracts

The economic effects of the banking panics were devastating. Aside from the obvious impact of the closing of failed banks and the subsequent loss of deposits by bank customers, the money supply accelerated its downward spiral. Although the economy had flattened out after the first wave of bank

failures in October–December 1930, with the industrial production index steadying from 79 in December 1930 to 80 in April 1931, the remainder of 1931 brought a series of shocks from which the economy was not to recover for some time.

Second Wave of Banking Failure

In May, the failure of Austria's largest bank, the Kredit-anstalt, touched off financial panics in Europe. In September 1931, having had enough of the distress associated with the international transmission of economic depression, Britain abandoned its participation in the gold standard. Further, just as the United States' economy appeared to be trying to begin recovery, the second wave of bank failures hit the financial system in June and did not abate until December. In addition, the Hoover administration in December 1931, adhering to its principles of limited government, embarked on a campaign to balance the federal budget. Tax increases resulted the following June, just as the economy was to hit the first low point of its so-called "double bottom" (Hoover, 1952).

The results of these events are now evident. Between January and December 1931 the industrial production index declined from 78 to 66, or 15.4 percent, the consumer price index fell 9.4 percent, the nominal supply of M1 dipped 5.7 percent, the ex post real interest rate[5] remained at 11.3 percent, and although the supply of high-powered money[6] actually increased 5.5 percent, the currency–deposit and reserve–deposit ratios began their upward ascent, and thus the money multiplier started its downward plunge (Hamilton, 1987). If the economy had flattened out in the spring of 1931, then by December output, the money supply, and the price level were all on negative growth paths that were dragging the economy deeper into depression.

Third Wave of Banking Failure

The economic difficulties were far from over. The economy displayed some evidence of recovery in late summer/early fall of 1932. However, in December 1932 the third, and largest, wave of banking panics hit the financial markets and the collapse of the economy arrived with the business cycle hitting bottom in March 1933. Industrial production between January 1932 and March 1933 fell an additional 15.6 percent. For the combined years of 1932 and 1933, the consumer price index fell a cumulative 16.2 percent, the nominal supply of M1 dropped 21.6 percent, the nominal M2 money supply fell 34.7 percent, and although the supply of high-powered money increased 8.4 percent, the currency–deposit and reserve–deposit ratios accelerated their upward ascent. Thus the money multiplier continued on a downward plunge that was not arrested until March 1933. Similar behaviors for real GDP, prices, money supplies and other key macroeconomic variables occurred in many European economies as well (Snowdon and Vane, 1999; Temin, 1989).

An examination of the macroeconomic data in August 1929 compared to March 1933 provides a stark contrast. The unemployment rate of 3 percent in August 1929 was at 25 percent in March 1933. The industrial production index of 114 in August 1929 was at 54 in March 1933, or a 52.6 percent decrease. The money supply had fallen 35 percent, prices plummeted by about 33 percent, and more than one-third of banks in the United States were either closed or taken over by other banks. The "new era" ushered in by "the roaring twenties" was over. Roosevelt took office in March 1933, a nationwide bank holiday was declared from March 6 until March 13, and the United States abandoned the international gold standard in April 1933. Recovery commenced immediately and the economy began its long path back to the pre-1929 secular growth trend.

Table 1 summarizes the drop in industrial production in the major economies of Western Europe and

North America. Table 2 gives gross national product estimates for the United States from 1928 to 1941. The constant price series adjusts for inflation and deflation.

Table 1
Indices of Total Industrial Production, 1927 to 1935 (1929 = 100)

	1927	1928	1929	1930	1931	1932	1933	1934	1935
Britain	95	94	100	94	86	89	95	105	114
Canada	85	94	100	91	78	68	69	82	90
France	84	94	100	99	85	74	83	79	77
Germany	95	100	100	86	72	59	68	83	96
Italy	87	99	100	93	84	77	83	85	99
Netherlands	87	94	100	109	101	90	90	93	95
Sweden	85	88	100	102	97	89	93	111	125
U.S.	85	90	100	83	69	55	63	69	79

Source: *Industrial Statistics, 1900-57* (Paris, OEEC, 1958), Table 2.

Table 2
U.S. GNP at Constant (1929) and Current Prices, 1928-1941

Year	GNP at constant (1929) prices (billions of $)	GNP at current prices (billions of $)
1928	98.5	98.7
1929	104.4	104.6
1930	95.1	91.2
1931	89.5	78.5
1932	76.4	58.6
1933	74.2	56.1
1934	80.8	65.5
1935	91.4	76.5
1936	100.9	83.1
1937	109.1	91.2
1938	103.2	85.4
1939	111.0	91.2
1940	121.0	100.5
1941	131.7	124.7

Contemporary Explanations

The economics profession during the 1930s was at a loss to explain the Depression. The most prominent conventional explanations were of two types. First, some observers at the time firmly grounded their explanations on the two pillars of classical macroeconomic thought, Say's Law and the belief in the self-equilibrating powers of the market. Many argued that it was simply a question of time before wages and prices adjusted fully enough for the economy to return to full employment and achieve the realization of the putative axiom that "supply creates its own demand." Second, the Austrian school of thought argued that the Depression was the inevitable result of overinvestment during the 1920s. The best remedy for the situation was to let the Depression run its course so that the economy could be purified from the negative effects of the false expansion. Government intervention was viewed by the Austrian school as a mechanism that would simply prolong the agony and make any subsequent depression worse than it

would ordinarily be (Hayek, 1966; Hayek, 1967).

Liquidationist Theory

The Hoover administration and the Federal Reserve Board also contained several so-called "liquidationists." These individuals basically believed that economic agents should be forced to re-arrange their spending proclivities and alter their alleged profligate use of resources. If it took mass bankruptcies to produce this result and wipe the slate clean so that everyone could have a fresh start, then so be it. The liquidationists viewed the events of the Depression as an economic penance for the speculative excesses of the 1920s. Thus, the Depression was the price that was being paid for the misdeeds of the previous decade. This is perhaps best exemplified in the well-known quotation of Treasury Secretary Andrew Mellon, who advised President Hoover to "Liquidate labor, liquidate stocks, liquidate the farmers, liquidate real estate." Mellon continued, "It will purge the rottenness out of the system. High costs of living and high living will come down. People will work harder, live a more moral life. Values will be adjusted, and enterprising people will pick up the wrecks from less competent people" (Hoover, 1952). Hoover apparently followed this advice as the Depression wore on. He continued to reassure the public that if the principles of orthodox finance were faithfully followed, recovery would surely be the result.

The business press at the time was not immune from such liquidationist prescriptions either. The Commercial and Financial Chronicle, in an August 3, 1929 editorial entitled "Is Not Group Speculating Conspiracy, Fostering Sham Prosperity?" complained of the economy being replete with profligate spending including:

(a) The luxurious diversification of diet advantageous to dairy men … and fruit growers …; (b) luxurious dressing … more silk and rayon …; (c) free spending for automobiles and their accessories, gasoline, house furnishings and equipment, radios, travel, amusements and sports; (d) the displacement from the farms by tractors and autos of produce-consuming horses and mules to a number aggregating 3,700,000 for the period 1918–1928 … (e) the frills of education to thousands for whom places might better be reserved at bench or counter or on the farm. (Quoted from Nelson, 1991)

Persons, in a paper which appeared in the November 1930 Quarterly Journal of Economics, demonstrates that some academic economists also held similar liquidationist views.

Although certainly not universal, the descriptions above suggest that no small part of the conventional wisdom at the time believed the Depression to be a penitence for past sins. In addition, it was thought that the economy would be restored to full employment equilibrium once wages and prices adjusted sufficiently. Say's Law will ensure the economy will return to health, and supply will create its own demand sufficient to return to prosperity, if we simply let the system work its way through. In his memoirs published in 1952, 20 years after his election defeat, Herbert Hoover continued to steadfastly maintain that if Roosevelt and the New Dealers would have stuck to the policies his administration put in place, the economy would have made a full recovery within 18 months after the election of 1932. We have to intensify our resolve to "stay the course." All will be well in time if we just "take our medicine." In hindsight, it challenges the imagination to think up worse policy prescriptions for the events of 1929–33.

Modern Explanations

There remains considerable debate regarding the economic explanations for the behavior of the

business cycle between August 1929 and March 1933. This section describes the main hypotheses that have been presented in the literature attempting to explain the causes for the depth, protracted length, and worldwide propagation of the Great Depression.

The United States' experience, considering the preponderance of empirical results and historical simulations contained in the economic literature, can largely be accounted for by the monetary hypothesis of Friedman and Schwartz (1963) together with the nonmonetary/financial hypotheses of Bernanke (1983) and Fisher (1933). That is, most, but not all, of the characteristic phases of the business cycle and depth to which output fell from 1929 to 1933 can be accounted for by the monetary and nonmonetary/financial hypotheses. The international experience, well documented in Choudri and Kochin (1980), Hamilton (1988), Temin (1989), Bernanke and James (1991), and Eichengreen (1992), can be properly understood as resulting from a flawed interwar gold standard. Each of these hypotheses is explained in greater detail below.

Nonmonetary/Nonfinancial Theories

It should be noted that I do not include a section covering the nonmonetary/nonfinancial theories of the Great Depression. These theories, including Temin's (1976) focus on autonomous consumption decline, the collapse of housing construction contained in Anderson and Butkiewicz (1980), the effects of the stock market crash, the uncertainty hypothesis of Romer (1990), and the Smoot–Hawley Tariff Act of 1930, are all worthy of mention and can rightly be apportioned some of the responsibility for initiating the Depression. However, any theory of the Depression must be able to account for the protracted problems associated with the punishing deflation imposed on the United States and the world during that era. While the nonmonetary/nonfinancial theories go a long way accounting for the *impetus* for, and *first year* of the Depression, my reading of the empirical results of the economic literature indicates that they do not have the explanatory power of the three other theories mentioned above to account for the depths to which the economy plunged.

Moreover, recent research by Olney (1999) argues convincingly that the decline in consumption was not autonomous at all. Rather, the decline resulted because high consumer indebtedness threatened future consumption spending because default was expensive. Olney shows that households were shouldering an unprecedented burden of installment debt – especially for automobiles. In addition, down payments were large and contracts were short. Missed installment payments triggered repossession, reducing consumer wealth in 1930 because households lost all acquired equity. Cutting consumption was the only viable strategy in 1930 for avoiding default.

The Monetary Hypothesis

In reviewing the economic history of the Depression above, it was mentioned that the supply of money fell by 35 percent, prices dropped by about 33 percent, and one-third of all banks vanished. Milton Friedman and Anna Schwartz, in their 1963 book *A Monetary History of the United States, 1867–1960*, call this massive drop in the supply of money "The Great Contraction."

Friedman and Schwartz (1963) discuss and painstakingly document the synchronous movements of the real economy with the disruptions that occurred in the financial sector. They point out that the series of bank failures that occurred beginning in October 1930 worsened economic conditions in two ways. First, bank shareholder wealth was reduced as banks failed. Second, and most importantly, the bank failures were exogenous shocks and led to the drastic decline in the money supply. The persistent deflation of the 1930s follows directly from this "great contraction."

Criticisms of Fed Policy

However, this raises an important question: Where was the Federal Reserve while the money supply and the financial system were collapsing? If the Federal Reserve was created in 1913 primarily to be the "lender of last resort" for troubled financial institutions, it was failing miserably. Friedman and Schwartz pin the blame squarely on the Federal Reserve and the failure of monetary policy to offset the contractions in the money supply. As the money multiplier continued on its downward path, the monetary base, rather than being aggressively increased, simply progressed slightly upwards on a gently positive sloping time path. As banks were failing in waves, was the Federal Reserve attempting to contain the panics by aggressively lending to banks scrambling for liquidity? The unfortunate answer is "no." When the panics were occurring, was there discussion of suspending deposit convertibility or suspension of the gold standard, both of which had been successfully employed in the past? Again the unfortunate answer is "no." Did the Federal Reserve consider the fact that it had an abundant supply of free gold, and therefore that monetary expansion was feasible? Once again the unfortunate answer is "no." The argument can be summarized by the following quotation:

At all times throughout the 1929–33 contraction, alternative policies were available to the System by which it could have kept the stock of money from falling, and indeed could have increased it at almost any desired rate. Those policies did not involve radical innovations. They involved measures of a kind the System had taken in earlier years, of a kind explicitly contemplated by the founders of the System to meet precisely the kind of banking crisis that developed in late 1930 and persisted thereafter. They involved measures that were actually proposed and very likely would have been adopted under a slightly different bureaucratic structure or distribution of power, or even if the men in power had had somewhat different personalities. Until late 1931 – and we believe not even then – the alternative policies involved no conflict with the maintenance of the gold standard. Until September 1931, the problem that recurrently troubled the System was how to keep the gold inflows under control, not the reverse. (Friedman and Schwartz, 1963)

The inescapable conclusion is that it was a failure of the policies of the Federal Reserve System in responding to the crises of the time that made the Depression as bad as it was. If monetary policy had responded differently, the economic events of 1929–33 need not have been as they occurred. This assertion is supported by the results of Fackler and Parker (1994). Using counterfactual historical simulations, they show that if the Federal Reserve had kept the M1 money supply growing along its pre-October 1929 trend of 3.3 percent annually, most of the Depression would have been averted. McCallum (1990) also reaches similar conclusions employing a monetary base feedback policy in his counterfactual simulations.

Lack of Leadership at the Fed

Friedman and Schwartz trace the seeds of these regrettable events to the death of Federal Reserve Bank of New York President Benjamin Strong in 1928. Strong's death altered the locus of power in the Federal Reserve System and left it without effective leadership. Friedman and Schwartz maintain that Strong had the personality, confidence and reputation in the financial community to lead monetary policy and sway policy makers to his point of view. Friedman and Schwartz believe that Strong would not have permitted the financial panics and liquidity crises to persist and affect the real economy. Instead, after Governor Strong died, the conduct of open market operations changed from a five-man committee dominated by the New York Federal Reserve to that of a 12-man committee of Federal Reserve Bank governors. Decisiveness in leadership was replaced by inaction and drift. Others (Temin, 1989; Wicker, 1965) reject

this point, claiming the policies of the Federal Reserve in the 1930s were not inconsistent with the policies pursued in the decade of the 1920s.

The Fed's Failure to Distinguish between Nominal and Real Interest Rates

Meltzer (1976) also points out errors made by the Federal Reserve. His argument is that the Federal Reserve failed to distinguish between nominal and real interest rates. That is, while nominal rates were falling, the Federal Reserve did virtually nothing, since it construed this to be a sign of an "easy" credit market. However, in the face of deflation, real rates were rising and there was in fact a "tight" credit market. Failure to make this distinction led money to be a contributing factor to the initial decline of 1929.

Deflation

Cecchetti (1992) and Nelson (1991) bolster the monetary hypothesis by demonstrating that the deflation during the Depression was anticipated at short horizons, once it was under way. The result, using the Fisher equation, is that high ex ante real interest rates were the transmission mechanism that led from falling prices to falling output. In addition, Cecchetti (1998) and Cecchetti and Karras (1994) argue that if the lower bound of the nominal interest rate is reached, then continued deflation renders the opportunity cost of holding money negative. In this instance the nature of money changes. Now the rate of deflation places a floor on the real return nonmoney assets must provide to make them attractive to hold. If they cannot exceed the rate on money holdings, then agents will move their assets into cash and the result will be negative net investment and a decapitalization of the economy.

Critics of the Monetary Hypothesis

The monetary hypothesis, however, is not without its detractors. Paul Samuelson observes that the monetary base did not fall during the Depression. Moreover, expecting the Federal Reserve to have aggressively increased the monetary base by whatever amount was necessary to stop the decline in the money supply is hindsight. A course of action for monetary policy such as this was beyond the scope of discussion prevailing at the time. In addition, others, like Moses Abramovitz, point out that the money supply had endogenous components that were beyond the Federal Reserve's ability to control. Namely, the money supply may have been falling as a result of declining economic activity, or so-called "reverse causation." Moreover the gold standard, to which the United States continued to adhere until March 1933, also tied the hands of the Federal Reserve in so far as gold outflows that occurred required the Federal Reserve to contract the supply of money. These views are also contained in Temin (1989) and Eichengreen (1992), as discussed below.

Bernanke (1983) argues that the monetary hypothesis: (i) is not a complete explanation of the link between the financial sector and aggregate output in the 1930s; (ii) does not explain how it was that decreases in the money supply caused output to keep falling over many years, especially since it is widely believed that changes in the money supply only change prices and other nominal economic values in the long run, not real economic values like output ; and (iii) is quantitatively insufficient to explain the depth of the decline in output. Bernanke (1983) not only resurrected and sharpened Fisher's (1933) debt deflation hypothesis, but also made further contributions to what has come to be known as the nonmonetary/financial hypothesis.

The Nonmonetary/Financial Hypothesis

Bernanke (1983), building on the monetary hypothesis of Friedman and Schwartz (1963), presents an

alternative interpretation of the way in which the financial crises may have affected output. The argument involves both the effects of debt deflation and the impact that bank panics had on the ability of financial markets to efficiently allocate funds from lenders to borrowers. These nonmonetary/financial theories hold that events in financial markets other than shocks to the money supply can help to account for the paths of output and prices during the Great Depression.

Fisher (1933) asserted that the dominant forces that account for "great" depressions are (nominal) over-indebtedness and deflation. Specifically, he argued that real debt burdens were substantially increased when there were dramatic declines in the price level and nominal incomes. The combination of deflation, falling nominal income and increasing real debt burdens led to debtor insolvency, lowered aggregate demand, and thereby contributed to a continuing decline in the price level and thus further increases in the real burden of debt.

The "Credit View"

Bernanke (1983), in what is now called the "credit view," provided additional details to help explain Fisher's debt deflation hypothesis. He argued that in normal circumstances, an initial decline in prices merely reallocates wealth from debtors to creditors, such as banks. Usually, such wealth redistributions are minor in magnitude and have no first-order impact on the economy. However, in the face of large shocks, deflation in the prices of assets forfeited to banks by debtor bankruptcies leads to a decline in the nominal value of assets on bank balance sheets. For a given value of bank liabilities, also denominated in nominal terms, this deterioration in bank assets threatens insolvency. As banks reallocate away from loans to safer government securities, some borrowers, particularly small ones, are unable to obtain funds, often at any price. Further, if this reallocation is long-lived, the shortage of credit for these borrowers helps to explain the persistence of the downturn. As the disappearance of bank financing forces lower expenditure plans, aggregate demand declines, which again contributes to the downward deflationary spiral. For debt deflation to be operative, it is necessary to demonstrate that there was a substantial build-up of debt prior to the onset of the Depression and that the deflation of the 1930s was at least partially unanticipated at medium- and long-term horizons at the time that the debt was being incurred. Both of these conditions appear to have been in place (Fackler and Parker, 2001; Hamilton, 1992; Evans and Wachtel, 1993).

The Breakdown in Credit Markets

In addition, the financial panics which occurred hindered the credit allocation mechanism. Bernanke (1983) explains that the process of credit intermediation requires substantial information gathering and non-trivial market-making activities. The financial disruptions of 1930–33 are correctly viewed as substantial impediments to the performance of these services and thus impaired the efficient allocation of credit between lenders and borrowers. That is, financial panics and debtor and business bankruptcies resulted in a increase in the real cost of credit intermediation. As the cost of credit intermediation increased, sources of credit for many borrowers (especially households, farmers and small firms) became expensive or even unobtainable at any price. This tightening of credit put downward pressure on aggregate demand and helped turn the recession of 1929–30 into the Great Depression. The empirical support for the validity of the nonmonetary/financial hypothesis during the Depression is substantial (Bernanke, 1983; Fackler and Parker, 1994, 2001; Hamilton, 1987, 1992), although support for the "credit view" for the transmission mechanism of monetary policy in post-World War II economic activity is substantially weaker. In combination, considering the preponderance of empirical results and historical simulations contained in the economic literature, the monetary hypothesis and the

nonmonetary/financial hypothesis go a substantial distance toward accounting for the economic experiences of the United States during the Great Depression.

The Role of Pessimistic Expectations

To this combination, the behavior of expectations should also be added. As explained by James Tobin, there was another reason for a "change in the character of the contraction" in 1931. Although Friedman and Schwartz attribute this "change" to the bank panics that occurred, Tobin points out that change also took place because of the emergence of pessimistic expectations. If it was thought that the early stages of the Depression were symptomatic of a recession that was not different in kind from similar episodes in our economic history, and that recovery was a real possibility, the public need not have had pessimistic expectations. Instead the public may have anticipated things would get better. However, after the British left the gold standard, expectations changed in a very pessimistic way. The public may very well have believed that the business cycle downturn was not going to be reversed, but rather was going to get worse than it was. When households and business investors begin to make plans based on the economy getting worse instead of making plans based on anticipations of recovery, the depressing economic effects on consumption and investment of this switch in expectations are common knowledge in the modern macroeconomic literature. For the literature on the Great Depression, the empirical research conducted on the expectations hypothesis focuses almost exclusively on uncertainty (which is not the same thing as pessimistic/optimistic expectations) and its contribution to the onset of the Depression (Romer, 1990; Flacco and Parker, 1992). Although Keynes (1936) writes extensively about the state of expectations and their economic influence, the literature is silent regarding the empirical validity of the expectations hypothesis in 1931–33. Yet, in spite of this, the continued shocks that the United States' economy received demonstrated that the business cycle downturn of 1931–33 was of a different kind than had previously been known. Once the public believed this to be so and made their plans accordingly, the results had to have been economically devastating. There is no formal empirical confirmation and I have not segregated the expectations hypothesis as a separate hypothesis in the overview. However, the logic of the above argument compels me to be of the opinion that the expectations hypothesis provides an impressive addition to the monetary hypothesis and the nonmonetary/financial hypothesis in accounting for the economic experiences of the United States during the Great Depression.

The Gold Standard Hypothesis

Recent research on the operation of the interwar gold standard has deepened our understanding of the Depression and its international character. The way and manner in which the interwar gold standard was structured and operated provide a convincing explanation of the international transmission of deflation and depression that occurred in the 1930s.

The story has its beginning in the 1870–1914 period. During this time the gold standard functioned as a pegged exchange rate system where certain rules were observed. Namely, it was necessary for countries to permit their money supplies to be altered in response to gold flows in order for the price-specie flow mechanism to function properly. It operated successfully because countries that were gaining gold allowed their money supply to increase and raise the domestic price level to restore equilibrium and maintain the fixed exchange rate of their currency. Countries that were losing gold were obligated to permit their money supply to decrease and generate a decline in their domestic price level to restore equilibrium and maintain the fixed exchange rate of their currency. Eichengreen (1992) discusses and extensively documents that the gold standard of this period functioned as smoothly as it did because of

the international commitment countries had to the gold standard and the level of international cooperation exhibited during this time. “What rendered the commitment to the gold standard credible, then, was that the commitment was international, not merely national. That commitment was activated through international cooperation” (Eichengreen, 1992).

The gold standard was suspended when the hostilities of World War I broke out. By the end of 1928, major countries such as the United States, the United Kingdom, France and Germany had re-established ties to a functioning fixed exchange rate gold standard. However, Eichengreen (1992) points out that the world in which the gold standard functioned before World War I was not the same world in which the gold standard was being re-established. A credible commitment to the gold standard, as Hamilton (1988) explains, required that a country maintain fiscal soundness and political objectives that insured the monetary authority could pursue a monetary policy consistent with long-run price stability and continuous convertibility of the currency. Successful operation required these conditions to be in place before re-establishment of the gold standard was operational. However, many governments during the interwar period went back on the gold standard in the opposite set of circumstances. They re-established ties to the gold standard because they were incapable, due to the political chaos generated after World War I, of fiscal soundness and did not have political objectives conducive to reforming monetary policy such that it could insure long-run price stability. “By this criterion, returning to the gold standard could not have come at a worse time or for poorer reasons” (Hamilton, 1988). Kindleberger (1973) stresses the fact that the pre-World War I gold standard functioned as well as it did because of the unquestioned leadership exercised by Great Britain. After World War I and the relative decline of Britain, the United States did not exhibit the same strength of leadership Britain had shown before. The upshot is that it was an unsuitable environment in which to re-establish the gold standard after World War I and the interwar gold standard was destined to drift in a state of malperformance as no one took responsibility for its proper functioning. However, the problems did not end there.

Flaws in the Interwar International Gold Standard

Lack of Symmetry in the Response of Gold-Gaining and Gold-Losing Countries

The interwar gold standard operated with four structural/technical flaws that almost certainly doomed it to failure (Eichengreen, 1986; Temin, 1989; Bernanke and James, 1991). The first, and most damaging, was the lack of symmetry in the response of gold-gaining countries and gold-losing countries that resulted in a deflationary bias that was to drag the world deeper into deflation and depression. If a country was losing gold reserves, it was required to decrease its money supply to maintain its commitment to the gold standard. Given that a minimum gold reserve had to be maintained and that countries became concerned when the gold reserve fell within 10 percent of this minimum, little gold could be lost before the necessity of monetary contraction, and thus deflation, became a reality. Moreover, with a fractional gold reserve ratio of 40 percent, the result was a decline in the domestic money supply equal to 2.5 times the gold outflow. On the other hand, there was no such constraint on countries that experienced gold inflows. Gold reserves were accumulated without the binding requirement that the domestic money supply be expanded. Thus the price–specie flow mechanism ceased to function and the equilibrating forces of the pre-World War I gold standard were absent during the interwar period. If a country attracting gold reserves were to embark on a contractionary path, the result would be the further extraction of gold reserves from other countries on the gold standard and the imposition of deflation on their economies as well, as they were forced to contract their money supplies. “As it happened, both of the two major gold surplus countries – France and the United States, who at the time together held close to 60 percent of the world’s monetary gold – took deflationary paths in 1928–1929” (Bernanke and James,

1991).

Foreign Exchange Reserves

Second, countries that did not have reserve currencies could hold their minimum reserves in the form of both gold and convertible foreign exchange reserves. If the threat of devaluation of a reserve currency appeared likely, a country holding foreign exchange reserves could divest itself of the foreign exchange, as holding it became a more risky proposition. Further, the convertible reserves were usually only fractionally backed by gold. Thus, if countries were to prefer gold holdings as opposed to foreign exchange reserves for whatever reason, the result would be a contraction in the world money supply as reserves were destroyed in the movement to gold. This effect can be thought of as equivalent to the effect on the domestic money supply in a fractional reserve banking system of a shift in the public's money holdings toward currency and away from bank deposits.

The Bank of France and Open Market Operations

Third, the powers of many European central banks were restricted or excluded outright. In particular, as discussed by Eichengreen (1986), the Bank of France was prohibited from engaging in open market operations, i.e. the purchase or sale of government securities. Given that France was one of the countries amassing gold reserves, this restriction largely prevented them from adhering to the rules of the gold standard. The proper response would have been to expand their supply of money and inflate so as not to continue to attract gold reserves and impose deflation on the rest of the world. This was not done. France continued to accumulate gold until 1932 and did not leave the gold standard until 1936.

Inconsistent Currency Valuations

Lastly, the gold standard was re-established at parities that were unilaterally determined by each individual country. When France returned to the gold standard in 1926, it returned at a parity rate that is believed to have undervalued the franc. When Britain returned to the gold standard in 1925, it returned at a parity rate that is believed to have overvalued the pound. In this situation, the only sustainable equilibrium required the French to inflate their economy in response to the gold inflows. However, given their legacy of inflation during the 1921–26 period, France steadfastly resisted inflation (Eichengreen, 1986). The maintenance of the gold standard and the resistance to inflation were now inconsistent policy objectives. The Bank of France's inability to conduct open market operations only made matters worse. The accumulation of gold and the exporting of deflation to the world was the result.

The Timing of Recoveries

Taken together, the flaws described above made the interwar gold standard dysfunctional and in the end unsustainable. Looking back, we observe that the record of departure from the gold standard and subsequent recovery was different for many different countries. For some countries recovery came sooner. For some it came later. It is in this timing of departure from the gold standard that recent research has produced a remarkable empirical finding. From the work of Choudri and Kochin (1980), Eichengreen and Sachs (1985), Temin (1989), and Bernanke and James (1991), we now know that the sooner a country abandoned the gold standard, the quicker recovery commenced. Spain, which never restored its participation in the gold standard, missed the ravages of the Depression altogether. Britain left the gold standard in September 1931, and started to recover. Sweden left the gold standard at the same time as Britain, and started to recover. The United States left in March 1933, and recovery commenced. France, Holland, and Poland continued to have their economies struggle after the United

States' recovery began as they continued to adhere to the gold standard until 1936. Only after they left did recovery start; departure from the gold standard freed a country from the ravages of deflation.

The Fed and the Gold Standard: The "Midas Touch"

Temin (1989) and Eichengreen (1992) argue that it was the unbending commitment to the gold standard that generated deflation and depression worldwide. They emphasize that the gold standard required fiscal and monetary authorities around the world to submit their economies to internal adjustment and economic instability in the face of international shocks. Given how the gold standard tied countries together, if the gold parity were to be defended and devaluation was not an option, unilateral monetary actions by any one country were pointless. The end result is that Temin (1989) and Eichengreen (1992) reject Friedman and Schwartz's (1963) claim that the Depression was caused by a series of policy failures on the part of the Federal Reserve. Actions taken in the United States, according to Temin (1989) and Eichengreen (1992), cannot be properly understood in isolation with respect to the rest of the world. If the commitment to the gold standard was to be maintained, monetary and fiscal authorities worldwide had little choice in responding to the crises of the Depression. Why did the Federal Reserve continue a policy of inaction during the banking panics? Because the commitment to the gold standard, what Temin (1989) has labeled "The Midas Touch," gave them no choice but to let the banks fail. Monetary expansion and the injection of liquidity would lower interest rates, lead to a gold outflow, and potentially be contrary to the rules of the gold standard. Continued deflation due to gold outflows would begin to call into question the monetary authority's commitment to the gold standard. "Defending gold parity might require the authorities to sit idly by as the banking system crumbled, as the Federal Reserve did at the end of 1931 and again at the beginning of 1933" (Eichengreen, 1992). Thus, if the adherence to the gold standard were to be maintained, the money supply was endogenous with respect to the balance of payments and beyond the influence of the Federal Reserve.

Eichengreen (1992) concludes further that what made the pre-World War I gold standard so successful was absent during the interwar period: credible commitment to the gold standard activated through international cooperation in its implementation and management. Had these important ingredients of the pre-World War I gold standard been present during the interwar period, twentieth-century economic history may have been very different.

Recovery and the New Deal

March 1933 was the rock bottom of the Depression and the inauguration of Franklin D. Roosevelt represented a sharp break with the status quo. Upon taking office, a bank holiday was declared, the United States left the interwar gold standard the following month, and the government commenced with several measures designed to resurrect the financial system. These measures included: (i) the establishment of the Reconstruction Finance Corporation which set about funneling large sums of liquidity to banks and other intermediaries; (ii) the Securities Exchange Act of 1934 which established margin requirements for bank loans used to purchase stocks and bonds and increased information requirements to potential investors; and (iii) the Glass–Steagal Act which strictly separated commercial banking and investment banking. Although delivering some immediate relief to financial markets, lenders continued to be reluctant to extend credit after the events of 1929–33, and the recovery of financial markets was slow and incomplete. Bernanke (1983) estimates that the United States' financial system did not begin to shed the inefficiencies under which it was operating until the end of 1935.

The NIRA

Policies designed to promote different economic institutions were enacted as part of the New Deal. The National Industrial Recovery Act (NIRA) was passed on June 6, 1933 and was designed to raise prices and wages. In addition, the Act mandated the formation of planning boards in critical sectors of the economy. The boards were charged with setting output goals for their respective sector and the usual result was a restriction of production. In effect, the NIRA was a license for industries to form cartels and was struck down as unconstitutional in 1935. The Agricultural Adjustment Act of 1933 was similar legislation designed to reduce output and raise prices in the farming sector. It too was ruled unconstitutional in 1936.

Relief and Jobs Programs

Other policies intended to provide relief directly to people who were destitute and out of work were rapidly enacted. The Civilian Conservation Corps (CCC), the Tennessee Valley Authority (TVA), the Public Works Administration (PWA) and the Federal Emergency Relief Administration (FERA) were set up shortly after Roosevelt took office and provided jobs for the unemployed and grants to states for direct relief. The Civil Works Administration (CWA), created in 1933–34, and the Works Progress Administration (WPA), created in 1935, were also designed to provide work relief to the jobless. The Social Security Act was also passed in 1935. There surely are other programs with similar acronyms that have been left out, but the intent was the same. In the words of Roosevelt himself, addressing Congress in 1938:

Government has a final responsibility for the well-being of its citizenship. If private co-operative endeavor fails to provide work for the willing hands and relief for the unfortunate, those suffering hardship from no fault of their own have a right to call upon the Government for aid; and a government worthy of its name must make fitting response. (Quoted from Polenberg, 2000)

The Depression had shown the inaccuracies of classifying the 1920s as a “new era.” Rather, the “new era,” as summarized by Roosevelt’s words above and initiated in government’s involvement in the economy, began in March 1933.

The NBER business cycle chronology shows continuous growth from March 1933 until May 1937, at which time a 13-month recession hit the economy. The business cycle rebounded in June 1938 and continued on its upward march to and through the beginning of the United States’ involvement in World War II. The recovery that started in 1933 was impressive, with real GNP experiencing annual rates of the growth in the 10 percent range between 1933 and December 1941, excluding the recession of 1937–38 (Romer, 1993). However, as reported by Romer (1993), real GNP did not return to its pre-Depression level until 1937 and real GNP did not catch up to its pre-Depression secular trend until 1942. Indeed, the unemployment rate, peaking at 25 percent in March 1933, continued to dwell near or above the double-digit range until 1940. It is in this sense that most economists attribute the ending of the Depression to the onset of World War II. The War brought complete recovery as the unemployment rate quickly plummeted after December 1941 to its nadir during the War of below 2 percent.

Explanations for the Pace of Recovery

The question remains, however, that if the War completed the recovery, what initiated it and sustained it through the end of 1941? Should we point to the relief programs of the New Deal and the leadership of Roosevelt? Certainly, they had psychological/expectational effects on consumers and investors and helped to heal the suffering experienced during that time. However, as shown by Brown (1956), Peppers (1973), and Raynold, McMillin and Beard (1991), fiscal policy contributed little to the recovery, and certainly could have done much more.

Once again we return to the financial system for answers. The abandonment of the gold standard, the impact this had on the money supply, and the deliverance from the economic effects of deflation would have to be singled out as the most important contributor to the recovery. Romer (1993) stresses that Eichengreen and Sachs (1985) have it right; recovery did not come before the decision to abandon the old gold parity was made operational. Once this became reality, devaluation of the currency permitted expansion in the money supply and inflation which, rather than promoting a policy of beggar-thy-neighbor, allowed countries to escape the deflationary vortex of economic decline. As discussed in connection with the gold standard hypothesis, the simultaneity of leaving the gold standard and recovery is a robust empirical result that reflects more than simple temporal coincidence.

Romer (1993) reports an increase in the monetary base in the United States of 52 percent between April 1933 and April 1937. The M1 money supply virtually matched this increase in the monetary base, with 49 percent growth over the same period. The sources of this increase were two-fold. First, aside from the immediate monetary expansion permitted by devaluation, as Romer (1993) explains, monetary expansion continued into 1934 and beyond as gold flowed to the United States from Europe due to the increasing political unrest and heightened probability of hostilities that began the progression to World War II. Second, the increase in the money supply matched the increase in the monetary base and the Treasury chose not to sterilize the gold inflows. This is evidence that the monetary expansion resulted from policy decisions and not endogenous changes in the money multiplier. The new regime was freed from the constraints of the gold standard and the policy makers were intent on taking actions of a different nature than what had been done between 1929 and 1933.

Incompleteness of the Recovery before WWII

The Depression had turned a corner and the economy was emerging from the abyss in 1933. However, it still had a long way to go to reach full recovery. Friedman and Schwartz (1963) comment that "the most notable feature of the revival after 1933 was not its rapidity but its incompleteness." They claim that monetary policy and the Federal Reserve were passive after 1933. The monetary authorities did nothing to stop the fall from 1929 to 1933 and did little to promote the recovery. The Federal Reserve made no effort to increase the stock of high-powered money through the use of either open market operations or rediscounting; Federal Reserve credit outstanding remained "almost perfectly constant from 1934 to mid-1940" (Friedman and Schwartz, 1963). As we have seen above, it was the Treasury that was generating increases in the monetary base at the time by issuing gold certificates equal to the amount of gold reserve inflow and depositing them at the Federal Reserve. When the government spent the money, the Treasury swapped the gold certificates for Federal Reserve notes and this expanded the monetary base (Romer, 1993). Monetary policy was thought to be powerless to promote recovery, and instead it was fiscal policy that became the implement of choice. The research shows that fiscal policy could have done much more to aid in recovery – ironically fiscal policy was the vehicle that was now the focus of attention. There is an easy explanation for why this is so.

The Emergences of Keynes

The economics profession as a whole was at a loss to provide cogent explanations for the events of 1929–33. In the words of Robert Gordon (1998), "economics had lost its intellectual moorings, and it was time for a new diagnosis." There were no convincing answers regarding why the earlier theories of macroeconomic behavior failed to explain the events that were occurring, and worse, there was no set of principles that established a guide for proper actions in the future. That changed in 1936 with the publication of Keynes's book *The General Theory of Employment, Interest and Money*. Perhaps there has

been no other person and no other book in economics about which so much has been written. Many consider the arrival of Keynesian thought to have been a "revolution," although this too is hotly contested (see, for example, Laidler, 1999). The debates that *The General Theory* generated have been many and long-lasting. There is little that can be said here to add or subtract from the massive literature devoted to the ideas promoted by Keynes, whether they be viewed right or wrong. But the influence over academic thought and economic policy that was generated by *The General Theory* is not in doubt.

The time was right for a set of ideas that not only explained the Depression's course of events, but also provided a prescription for remedies that would create better economic performance in the future. Keynes and *The General Theory*, at the time the events were unfolding, provided just such a package. When all is said and done, we can look back in hindsight and argue endlessly about what Keynes "really meant" or what the "true" contribution of Keynesianism has been to the world of economics. At the time the Depression happened, Keynes represented a new paradigm for young scholars to latch on to. The stage was set for the nurturing of macroeconomics for the remainder of the twentieth century.

This article is a modified version of the introduction to Randall Parker, editor, Reflections on the Great Depression, Edward Elgar Publishing, 2002.

Bibliography

Olney, Martha. "Avoiding Default:The Role of Credit in the Consumption Collapse of 1930." *Quarterly Journal of Economics* 114, no. 1 (1999): 319-35.

Anderson, Barry L. and James L. Butkiewicz. "Money, Spending and the Great Depression." *Southern Economic Journal* 47 (1980): 388-403.

Balke, Nathan S. and Robert J. Gordon. "Historical Data." In *The American Business Cycle: Continuity and Change*, edited by Robert J. Gordon. Chicago: University of Chicago Press, 1986.

Bernanke, Ben S. "Nonmonetary Effects of the Financial Crisis in the Propagation of the Great Depression." *American Economic Review* 73, no. 3 (1983): 257-76.

Bernanke, Ben S. and Harold James. "The Gold Standard, Deflation, and Financial Crisis in the Great Depression: An International Comparison." In *Financial Markets and Financial Crises*, edited by R. Glenn Hubbard. Chicago: University of Chicago Press, 1991.

Brown, E. Cary. "Fiscal Policy in the Thirties: A Reappraisal." *American Economic Review* 46, no. 5 (1956): 857-79.

Cecchetti, Stephen G. "Prices during the Great Depression: Was the Deflation of 1930-1932 Really Anticipated?" *American Economic Review* 82, no. 1 (1992): 141-56.

Cecchetti, Stephen G. "Understanding the Great Depression: Lessons for Current Policy." In *The Economics of the Great Depression*, edited by Mark Wheeler. Kalamazoo, MI: W.E. Upjohn Institute for Employment Research, 1998.

Cecchetti, Stephen G. and Georgios Karras. "Sources of Output Fluctuations during the Interwar Period: Further Evidence on the Causes of the Great Depression." *Review of Economics and Statistics* 76, no. 1 (1994): 80-102

Choudri, Ehsan U. and Levis A. Kochin. "The Exchange Rate and the International Transmission of Business Cycle Disturbances: Some Evidence from the Great Depression." *Journal of Money, Credit, and*

Banking 12, no. 4 (1980): 565-74.

De Long, J. Bradford and Andrei Shleifer. "The Stock Market Bubble of 1929: Evidence from Closed-end Mutual Funds." *Journal of Economic History* 51, no. 3 (1991): 675-700.

Eichengreen, Barry. "The Bank of France and the Sterilization of Gold, 1926–1932." *Explorations in Economic History* 23, no. 1 (1986): 56-84.

Eichengreen, Barry. *Golden Fetters: The Gold Standard and the Great Depression, 1919–1939*. New York: Oxford University Press, 1992.

Eichengreen, Barry and Jeffrey Sachs. "Exchange Rates and Economic Recovery in the 1930s." *Journal of Economic History* 45, no. 4 (1985): 925-46.

Evans, Martin and Paul Wachtel. "Were Price Changes during the Great Depression Anticipated? Evidence from Nominal Interest Rates." *Journal of Monetary Economics* 32, no. 1 (1993): 3-34.

Fackler, James S. and Randall E. Parker. "Accounting for the Great Depression: A Historical Decomposition." *Journal of Macroeconomics* 16 (1994): 193-220.

Fackler, James S. and Randall E. Parker. "Was Debt Deflation Operative during the Great Depression?" East Carolina University Working Paper, 2001.

Fisher, Irving. "The Debt–Deflation Theory of Great Depressions." *Econometrica* 1, no. 4 (1933): 337-57.

Flacco, Paul R. and Randall E. Parker. "Income Uncertainty and the Onset of the Great Depression." *Economic Inquiry* 30, no. 1 (1992): 154-71.

Friedman, Milton and Anna J. Schwartz. *A Monetary History of the United States, 1867–1960*. Princeton, NJ: Princeton University Press, 1963.

Gordon, Robert J. *Macroeconomics*, seventh edition. New York: Addison Wesley, 1998.

Hamilton, James D. "Monetary Factors in the Great Depression." *Journal of Monetary Economics* 13 (1987): 1-25.

Hamilton, James D. "Role of the International Gold Standard in Propagating the Great Depression." *Contemporary Policy Issues* 6, no. 2 (1988): 67-89.

Hamilton, James D. "Was the Deflation during the Great Depression Anticipated? Evidence from the Commodity Futures Market." *American Economic Review* 82, no. 1 (1992): 157-78.

Hayek, Friedrich A. von. *Monetary Theory and the Trade Cycle*. New

York: A. M. Kelley, 1967 (originally published in 1929).

Hayek, Friedrich A. von, *Prices and Production*. New York: A. M.

Kelley, 1966 (originally published in 1931).

Hoover, Herbert. *The Memoirs of Herbert Hoover: The Great Depression, 1929–1941*. New York: Macmillan, 1952.

Keynes, John M. *The General Theory of Employment, Interest, and Money*. London: Macmillan, 1936.

Kindleberger, Charles P. *The World in Depression, 1929–1939*. Berkeley: University of California Press,

1973.

Laidler, David. *Fabricating the Keynesian Revolution*. Cambridge: Cambridge University Press, 1999.

McCallum, Bennett T. "Could a Monetary Base Rule Have Prevented the Great Depression?" *Journal of Monetary Economics* 26 (1990): 3-26.

Meltzer, Allan H. "Monetary and Other Explanations of the Start of the Great Depression." *Journal of Monetary Economics* 2 (1976): 455-71.

Mishkin, Frederick S. "The Household Balance Sheet and the Great Depression." *Journal of Economic History* 38, no. 4 (1978): 918-37.

Nelson, Daniel B. "Was the Deflation of 1929–1930 Anticipated? The Monetary Regime as Viewed by the Business Press." *Research in Economic History* 13 (1991): 1-65.

Peppers, Larry. "Full Employment Surplus Analysis and Structural Change: The 1930s." *Explorations in Economic History* 10 (1973): 197-210..

Persons, Charles E. "Credit Expansion, 1920 to 1929, and Its Lessons." *Quarterly Journal of Economics* 45, no. 1 (1930): 94-130.

Polenberg, Richard. *The Era of Franklin D. Roosevelt, 1933–1945: A Brief History with Documents*. Boston: Bedford/St. Martin's, 2000.

Raynold, Prosper, W. Douglas McMillin and Thomas R. Beard. "The Impact of Federal Government Expenditures in the 1930s." *Southern Economic Journal* 58, no. 1 (1991): 15-28.

Romer, Christina D. "World War I and the Postwar Depression: A Reappraisal Based on Alternative Estimates of GNP." *Journal of Monetary Economics* 22, no. 1 (1988): 91-115.

Romer, Christina D. "The Great Crash and the Onset of the Great Depression." *Quarterly Journal of Economics* 105, no. 3 (1990): 597-624.

Romer, Christina D. "The Nation in Depression." *Journal of Economic Perspectives* 7, no. 2 (1993): 19-39.

Snowdon, Brian and Howard R. Vane. *Conversations with Leading Economists: Interpreting Modern Macroeconomics*, Cheltenham, UK: Edward Elgar, 1999.

Soule, George H. *Prosperity Decade, From War to Depression: 1917–1929*. New York: Rinehart, 1947.

Temin, Peter. *Did Monetary Forces Cause the Great Depression?* New York: W.W. Norton, 1976.

Temin, Peter. *Lessons from the Great Depression*. Cambridge, MA: MIT Press, 1989.

White, Eugene N. "The Stock Market Boom and Crash of 1929 Revisited." *Journal of Economic Perspectives* 4, no. 2 (1990): 67-83.

Wicker, Elmus. "Federal Reserve Monetary Policy, 1922–33: A Reinterpretation." *Journal of Political Economy* 73, no. 4 (1965): 325-43.

1 Bankers' acceptances are explained at http://www.rich.frb.org/pubs/instruments/ch10.html.

2 Liquidity is the ease of converting an asset into money.

3 The monetary base is measured as the sum of currency in the hands of the public plus reserves in the banking system. It is also called high-powered money since the monetary base is the quantity that gets multiplied into greater amounts of money supply as banks make loans and people spend and thereby create new bank deposits.

4 The money multiplier equals [D/R*(1 + D/C)]/(D/R + D/C + D/E), where

D = deposits, R = reserves, C = currency and E = excess reserves in the

banking system.

5 The real interest rate adjusts the observed (nominal) interest rate for inflation or deflation. Ex post refers to the real interest rate after the actual change in prices has been observed; ex ante refers to the real interest rate that is expected at the time the lending occurs.

6 See note 3.

Citation: Parker, Randall. "An Overview of the Great Depression". EH.Net Encyclopedia, edited by Robert Whaples. March 16, 2008. URL http://eh.net/encyclopedia/an-overview-of-the-great-depression/

Gold Standard

Lawrence H. Officer, University of Illinois at Chicago

The gold standard is the most famous monetary system that ever existed. The periods in which the gold standard flourished, the groupings of countries under the gold standard, and the dates during which individual countries adhered to this standard are delineated in the first section. Then characteristics of the gold standard (what elements make for a gold standard), the various types of the standard (domestic versus international, coin versus other, legal versus effective), and implications for the money supply of a country on the standard are outlined. The longest section is devoted to the "classical" gold standard, the predominant monetary system that ended in 1914 (when World War I began), followed by a section on the "interwar" gold standard, which operated between the two World Wars (the 1920s and 1930s).

Countries and Dates on the Gold Standard

Countries on the gold standard and the periods (or beginning and ending dates) during which they were on gold are listed in Tables 1 and 2 for the classical and interwar gold standards. Types of gold standard, ambiguities of dates, and individual-country cases are considered in later sections. The country groupings reflect the importance of countries to establishment and maintenance of the standard. Center countries — Britain in the classical standard, the United Kingdom (Britain's legal name since 1922) and the United States in the interwar period — were indispensable to the spread and functioning of the gold standard. Along with the other core countries — France and Germany, and the United States in the classical period — they attracted other countries to adopt the gold standard, in particular, British colonies and dominions, Western European countries, and Scandinavia. Other countries — and, for some purposes, also British colonies and dominions — were in the periphery: acted on, rather than

actors, in the gold-standard eras, and generally not as committed to the gold standard.

Table 1Countries on Classical Gold Standard

Country	Type of Gold Standard	Period
Center Country		
Britaina	Coin	1774-1797b, 1821-1914
Other Core Countries		
United Statesc	Coin	1879-1917d
Francee	Coin	1878-1914
Germany	Coin	1871-1914
British Colonies and Dominions		
Australia	Coin	1852-1915
Canadaf	Coin	1854-1914
Ceylon	Coin	1901-1914
Indiag	Exchange (British pound)	1898-1914
Western Europe		
Austria-Hungaryh	Coin	1892-1914
Belgiumi	Coin	1878-1914
Italy	Coin	1884-1894
Liechtenstein	Coin	1898-1914
Netherlandsj	Coin	1875-1914
Portugalk	Coin	1854-1891
Switzerland	Coin	1878-1914
Scandinavia		
Denmarkl	Coin	1872-1914
Finland	Coin	1877-1914
Norway	Coin	1875-1914
Sweden	Coin	1873-1914
Eastern Europe		
Bulgaria	Coin	1906-1914
Greece	Coin	1885, 1910-1914
Montenegro	Coin	1911-1914
Romania	Coin	1890-1914
Russia	Coin	1897-1914
Middle East		
Egypt	Coin	1885-1914
Turkey (Ottoman Empire)	Coin	1881m-1914
Asia		
Japann	Coin	1897-1917
Philippines	Exchange (U.S. dollar)	1903-1914
Siam	Exchange (British pound)	1908-1914
Straits Settlementso	Exchange (British pound)	1906-1914
Mexico and Central America		
Costa Rica	Coin	1896-1914
Mexico	Coin	1905-1913
South America		

Argentina	Coin	1867-1876, 1883-1885, 1900-1914
Bolivia	Coin	1908-1914
Brazil	Coin	1888-1889, 1906-1914
Chile	Coin	1895-1898
Ecuador	Coin	1898-1914
Peru	Coin	1901-1914
Uruguay	Coin	1876-1914
Africa		
Eritrea	Exchange (Italian lira)	1890-1914
German East Africa	Exchange (German mark)	1885p-1914
Italian Somaliland	Exchange (Italian lira)	1889p-1914

a Including colonies (except British Honduras) and possessions without a national currency: New Zealand and certain other Oceanic colonies, South Africa, Guernsey, Jersey, Malta, Gibraltar, Cyprus, Bermuda, British West Indies, British Guiana, British Somaliland, Falkland Islands, other South and West African colonies.
b Or perhaps 1798.
c Including countries and territories with U.S. dollar as exclusive or predominant currency: British Honduras (from 1894), Cuba (from 1898), Dominican Republic (from 1901), Panama (from 1904), Puerto Rico (from 1900), Alaska, Aleutian Islands, Hawaii, Midway Islands (from 1898), Wake Island, Guam, and American Samoa.
d Except August October 1914.
e Including Tunisia (from 1891) and all other colonies except Indochina.
f Including Newfoundland (from 1895).
g Including British East Africa, Uganda, Zanzibar, Mauritius, and Ceylon (to 1901).
h Including Montenegro (to 1911).
I Including Belgian Congo.
j Including Netherlands East Indies.
k Including colonies, except Portuguese India.
l Including Greenland and Iceland.
m Or perhaps 1883.
n Including Korea and Taiwan.
o Including Borneo.
p Approximate beginning date.

Sources: Bloomfield (1959, pp. 13, 15; 1963), Bordo and Kydland (1995), Bordo and Schwartz (1996), Brown (1940, pp.15-16), Bureau of the Mint (1929), de Cecco (1984, p. 59), Ding (1967, pp. 6- 7), Director of the Mint (1913, 1917), Ford (1985, p. 153), Gallarotti (1995, pp. 272 75), Gunasekera (1962), Hawtrey (1950, p. 361), Hershlag (1980, p. 62), Ingram (1971, p. 153), Kemmerer (1916; 1940, pp. 9-10; 1944, p. 39), Kindleberger (1984, pp. 59-60), Lampe (1986, p. 34), MacKay (1946, p. 64), MacLeod (1994, p. 13), Norman (1892, pp. 83-84), Officer (1996, chs. 3 4), Pamuk (2000, p. 217), Powell (1999, p. 14), Rifaat (1935, pp. 47, 54), Shinjo (1962, pp. 81-83), Spalding (1928), Wallich (1950, pp. 32-36), Yeager (1976, p. 298), Young (1925).

Table 2Countries on Interwar
Gold Standard

Country	Type ofGold Standard	Ending Date

Exchange-Rate	Stabilization	Currency	Convertibility[a]				
United Kingdom[b]						1925	1931
Coin	1922[e]		*Other Core Countries*				
Bullion	1928		Germany	1924	1931		
Australia[g]						1925	1930
Exchange	1925		Canada[i]	1925	1929		
Exchange	1925		India[j]	1925	1931		
Coin	1929[k]		South Africa	1925	1933		
Austria						1922	1931
Exchange	1926		Danzig	1925	1935		
Coin	1925		Italy[m]	1927	1934		
Coin	1925		Portugal[o]	1929	1931		
Coin	1925		*Scandinavia*				
Bullion	1927		Finland	1925	1931		
Bullion	1928		Sweden	1922	1931		
Albania						1922	1939
Exchange	1927		Czechoslovakia	1923	1931		
Exchange	1928		Greece	1927	1932		
Exchange	1925		Latvia	1922	1931		
Coin	1922		Poland	1926	1936		
Exchange	1929		Yugoslavia	1925	1932		
Egypt						1925	1931
Exchange	1925		Palestine	1927	1931		
Exchange	1928		*Asia*				
Coin	1930		Malaya[t]	1925	1931		
Coin	1925		Philippines	1922	1933		
Exchange	1928		*Mexico and Central America*				
Exchange	1922		Guatemala	1925	1933		
Exchange	1922		Honduras	1923	1933		
Coin	1925		Nicaragua	1915	1932		
Coin	1920		*South America*				
Coin	1927		Bolivia	1926	1931		
Exchange	1928		Chile	1925	1931		
Coin	1923		Ecuador	1927	1932		
Exchange	1927		Peru	1928	1932		
Exchange	1928		Venezuela	1923	1930		

a And freedom of gold export and import.

b Including colonies (except British Honduras) and possessions without a national currency: Guernsey, Jersey, Malta, Gibraltar, Cyprus, Bermuda, British West Indies, British Guiana, British Somaliland, Falkland Islands, British West African and certain South African colonies, certain Oceanic colonies.

c Including countries and territories with U.S. dollar as exclusive or predominant currency: British Honduras, Cuba, Dominican Republic, Panama, Puerto Rico, Alaska, Aleutian Islands, Hawaii, Midway Islands, Wake Island, Guam, and American Samoa.

d Not applicable; "the United States dollar constituted the central point of reference in the whole post-

war stabilization effort and was throughout the period of stabilization at par with gold." — Brown (1940, p. 394)
e1919 for freedom of gold export.
f Including colonies and possessions, except Indochina and Syria.
g Including Papua (New Guinea) and adjoining islands.
h Kenya, Uganda, and Tanganyika.
I Including Newfoundland.
j Including Bhutan, Nepal, British Swaziland, Mauritius, Pemba Island, and Zanzibar.
k 1925 for freedom of gold export.
l Including Luxemburg and Belgian Congo.
m Including Italian Somaliland and Tripoli.
n Including Dutch Guiana and Curacao (Netherlands Antilles).
o Including territories, except Portuguese India.
p Including Liechtenstein.
q Including Greenland and Iceland.
r Including Greater Lebanon.
s Including Korea and Taiwan.
t Including Straits Settlements, Sarawak, Labuan, and Borneo.

Sources: Bett (1957, p. 36), Brown (1940), Bureau of the Mint (1929), Ding (1967, pp. 6-7), Director of the Mint (1917), dos Santos (1996, pp. 191-92), Eichengreen (1992, p. 299), *Federal Reserve Bulletin* (1928, pp. 562, 847; 1929, pp. 201, 265, 549; 1930, pp. 72, 440; 1931, p. 554; 1935, p. 290; 1936, pp. 322, 760), Gunasekera (1962), Jonung (1984, p. 361), Kemmerer (1954, pp. 301 302), League of Nations (1926, pp. 7, 15; 1927, pp. 165-69; 1929, pp. 208-13; 1931, pp. 265-69; 1937/38, p. 107; 1946, p. 2), Moggridge (1989, p. 305), Officer (1996, chs. 3-4), Powell (1999, pp. 23-24), Spalding (1928), Wallich (1950, pp. 32-37), Yeager (1976, pp. 330, 344, 359); Young (1925, p. 76).

Characteristics of Gold Standards

Types of Gold Standards

Pure Coin and Mixed Standards

In theory, "domestic" gold standards — those that do not depend on interaction with other countries — are of two types: "pure coin" standard and "mixed" (meaning coin and paper, but also called simply "coin") standard. The two systems share several properties. (1) There is a well-defined and fixed gold content of the domestic monetary unit. For example, the dollar is defined as a specified weight of pure gold. (2) Gold coin circulates as money with unlimited legal-tender power (meaning it is a compulsorily acceptable means of payment of any amount in any transaction or obligation). (3) Privately owned bullion (gold in mass, foreign coin considered as mass, or gold in the form of bars) is convertible into gold coin in unlimited amounts at the government mint or at the central bank, and at the "mint price" (of gold, the inverse of the gold content of the monetary unit). (4) Private parties have no restriction on their holding or use of gold (except possibly that privately created coined money may be prohibited); in particular, they may melt coin into bullion. The effect is as if coin were sold to the monetary authority (central bank or Treasury acting as a central bank) for bullion. It would make sense for the authority to sell gold bars directly for coin, even though not legally required, thus saving the cost of coining. Conditions (3) and (4) commit the monetary authority in effect to transact in coin and bullion in each direction such that the mint price, or gold content of the monetary unit, governs in the marketplace.

Under a pure coin standard, gold is the only money. Under a mixed standard, there are also paper currency (notes) — issued by the government, central bank, or commercial banks — and demand-deposit liabilities of banks. Government or central-bank notes (and central-bank deposit liabilities) are directly convertible into gold coin at the fixed established price on demand. Commercial-bank notes and demand deposits might be converted not directly into gold but rather into gold-convertible government or central-bank currency. This indirect convertibility of commercial-bank liabilities would apply certainly if the government or central- bank currency were legal tender but also generally even if it were not. As legal tender, gold coin is always exchangeable for paper currency or deposits at the mint price, and usually the monetary authority would provide gold bars for its coin. Again, two-way transactions in unlimited amounts fix the currency price of gold at the mint price. The credibility of the monetary-authority commitment to a fixed price of gold is the essence of a successful, ongoing gold-standard regime.

A pure coin standard did not exist in any country during the gold-standard periods. Indeed, over time, gold coin declined from about one-fifth of the world money supply in 1800 (2/3 for gold and silver coin together, as silver was then the predominant monetary standard) to 17 percent in 1885 (1/3 for gold and silver, for an eleven-major-country aggregate), 10 percent in 1913 (15 percent for gold and silver, for the major-country aggregate), and essentially zero in 1928 for the major-country aggregate (Triffin, 1964, pp. 15, 56). See Table 3. The zero figure means not that gold coin did not exist, rather that its main use was as reserves for Treasuries, central banks, and (generally to a lesser extent) commercial banks.

Table 3Structure of Money: Major-Countries Aggregatea(end of year)

1885	1928
8	50
33	0d
18	21
33	99

a Core countries: Britain, United States, France, Germany. Western Europe: Belgium, Italy, Netherlands, Switzerland. Other countries: Canada, Japan, Sweden.
b Metallic money, minor coin, paper currency, and demand deposits.
c 1885: Gold and silver coin; overestimate, as includes commercial-bank holdings that could not be isolated from coin held outside banks by the public. 1913: Gold and silver coin. 1928: Gold coin.
d Less than 0.5 percent.
e 1885 and 1913: Gold, silver, and foreign exchange. 1928: Gold and foreign exchange.
f Official gold: Gold in official reserves. Money gold: Gold-coin component of money supply.

Sources: Triffin (1964, p. 62), Sayers (1976, pp. 348, 352) for 1928 Bank of England dollar reserves (dated January 2, 1929).

An “international” gold standard, which naturally requires that more than one country be on gold, requires in addition freedom both of international gold flows (private parties are permitted to import or export gold without restriction) and of foreign-exchange transactions (an absence of exchange control). Then the fixed mint prices of any two countries on the gold standard imply a fixed exchange rate (“mint parity”) between the countries’ currencies. For example, the dollar- sterling mint parity was $4.8665635 per pound sterling (the British pound).

Gold-Bullion and Gold-Exchange Standards

In principle, a country can choose among four kinds of international gold standards — the pure coin and mixed standards, already mentioned, a gold-bullion standard, and a gold- exchange standard. Under a gold-bullion standard, gold coin neither circulates as money nor is it used as commercial-bank reserves, and the government does not coin gold. The monetary authority (Treasury or central bank) stands ready to transact with private parties, buying or selling gold bars (usable only for import or export, not as domestic currency) for its notes, and generally a minimum size of transaction is specified. For example, in 1925 1931 the Bank of England was on the bullion standard and would sell gold bars only in the minimum amount of 400 fine (pure) ounces, approximately £1699 or $8269. Finally, the monetary authority of a country on a gold-exchange standard buys and sells not gold in any form but rather gold-convertible foreign exchange, that is, the currency of a country that itself is on the gold coin or bullion standard.

Gold Points and Gold Export/Import

A fixed exchange rate (the mint parity) for two countries on the gold standard is an oversimplification that is often made but is misleading. There are costs of importing or exporting gold. These costs include freight, insurance, handling (packing and cartage), interest on money committed to the transaction, risk premium (compensation for risk), normal profit, any deviation of purchase or sale price from the mint price, possibly mint charges, and possibly abrasion (wearing out or removal of gold content of coin — should the coin be sold abroad by weight or as bullion). Expressing the exporting costs as the percent of the amount invested (or, equivalently, as percent of parity), the product of 1/100th of these costs and mint parity (the number of units of domestic currency per unit of foreign currency) is added to mint parity to obtain the gold-export point — the exchange rate at which gold is exported. To obtain the gold-import point, the product of 1/100th of the importing costs and mint parity is subtracted from mint parity.

If the exchange rate is greater than the gold-export point, private-sector “gold-point arbitrageurs” export gold, thereby obtaining foreign currency. Conversely, for the exchange rate less than the gold-import point, gold is imported and foreign currency relinquished. Usually the gold is, directly or indirectly, purchased from the monetary authority of the one country and sold to the monetary authority in the other. The domestic-currency cost of the transaction per unit of foreign currency obtained is the gold-export point. That per unit of foreign currency sold is the gold-import point. Also, foreign currency is sold, or purchased, at the exchange rate. Therefore arbitrageurs receive a profit proportional to the exchange-rate/gold-point divergence.

Gold-Point Arbitrage

However, the arbitrageurs’ supply of foreign currency eliminates profit by returning the exchange rate to below the gold-export point. Therefore perfect “gold-point arbitrage” would ensure that the exchange rate has upper limit of the gold-export point. Similarly, the arbitrageurs’ demand for foreign currency returns the exchange rate to above the gold-import point, and perfect arbitrage ensures that the exchange rate has that point as a lower limit. It is important to note what induces the private sector to engage in gold-point arbitrage: (1) the profit motive; and (2) the credibility of the commitment to (a) the fixed gold price and (b) freedom of foreign exchange and gold transactions, on the part of the monetary authorities of both countries.

Gold-Point Spread

The difference between the gold points is called the (gold-point) spread. The gold points and the spread

may be expressed as percentages of parity. Estimates of gold points and spreads involving center countries are provided for the classical and interwar gold standards in Tables 4 and 5. Noteworthy is that the spread for a given country pair generally declines over time both over the classical gold standard (evidenced by the dollar-sterling figures) and for the interwar compared to the classical period.

Table 4Gold-Point Estimates:
Classical Gold Standard

Countries	Period	Gold Pointsa(percent) Exportb	Spreadd(percent)	Method of Computation Importc
U.S./Britain	1881-1890	0.6585	0.7141	1.3726	PA
U.S./Britain	1891-1900	0.6550	0.6274	1.2824	PA
U.S./Britain	1901-1910	0.4993	0.5999	1.0992	PA
U.S./Britain	1911-1914	0.5025	0.5915	1.0940	PA
France/U.S.	1877-1913	0.6888	0.6290	1.3178	MED
Germany/U.S.	1894-1913	0.4907	0.7123	1.2030	MED
France/Britain	1877-1913	0.4063	0.3964	0.8027	MED
Germany/Britain	1877-1913	0.3671	0.4405	0.8076	MED
Germany/France	1877-1913	0.4321	0.5556	0.9877	MED
Austria/Britain	1912	0.6453	0.6037	1.2490	SE
Netherlands/Britain	1912	0.5534	0.3552	0.9086	SE
Scandinaviae /Britain	1912	0.3294	0.6067	0.9361	SE

a For numerator country.
b Gold-import point for denominator country.
c Gold-export point for denominator country.
d Gold-export point plus gold-import point.
e Denmark, Sweden, and Norway.

Method of Computation: PA = period average. MED = median exchange rate form estimate of various authorities for various dates, converted to percent deviation from parity. SE = single exchange-rate-form estimate, converted to percent deviation from parity.

Sources: U.S./Britain — Officer (1996, p. 174). France/U.S., Germany/U.S., France/Britain, Germany/Britain, Germany/France — Morgenstern (1959, pp. 178-81). Austria/Britain, Netherlands/Britain, Scandinavia/Britain — Easton (1912, pp. 358-63).

Table 5Gold-Point Estimates:
Interwar Gold Standard

Countries	Period	Gold Pointsa(percent)		Spreadd(percent)	Method of Computation
		Exportb			Importc
U.S./Britain	1925-1931	0.6287	0.4466	1.0753	PA
U.S./France	1926-1928e	0.4793	0.5067	0.9860	PA
U.S./France	1928-1933f	0.5743	0.3267	0.9010	PA
U.S./Germany	1926-1931	0.8295	0.3402	1.1697	PA
France/Britain	1926	0.2042	0.4302	0.6344	SE
France/Britain	1929-1933	0.2710	0.3216	0.5926	MED
Germany/Britain	1925-1933	0.3505	0.2676	0.6181	MED
Canada/Britain	1929	0.3521	0.3465	0.6986	SE
Netherlands/Britain	1929	0.2858	0.5146	0.8004	SE
Denmark/Britain	1926	0.4432	0.4930	0.9362	SE
Norway/Britain	1926	0.6084	0.3828	0.9912	SE
Sweden/Britain	1926	0.3881	0.3828	0.7709	SE

a For numerator country.
b Gold-import point for denominator country.
c Gold-export point for denominator country.
d Gold-export point plus gold-import point.
e To end of June 1928. French-franc exchange-rate stabilization, but absence of currency convertibility; see Table 2.
f Beginning July 1928. French-franc convertibility; see Table 2.

Method of Computation: PA = period average. MED = median exchange rate form estimate of various authorities for various dates, converted to percent deviation from parity. SE = single exchange-rate-form estimate, converted to percent deviation from parity.

Sources: U.S./Britain — Officer (1996, p. 174). U.S./France, U.S./Germany, France/Britain 1929- 1933, Germany/Britain — Morgenstern (1959, pp. 185-87). Canada/Britain, Netherlands/Britain — Einzig (1929, pp. 98-101) [Netherlands/Britain currencies' mint parity from Spalding (1928, p. 135). France/Britain 1926, Denmark/Britain, Norway/Britain, Sweden/Britain — Spalding (1926, pp. 429-30, 436).

The effective monetary standard of a country is distinguishable from its legal standard. For example, a country legally on bimetallism usually is effectively on either a gold or silver monometallic standard, depending on whether its "mint-price ratio" (the ratio of its mint price of gold to mint price of silver) is greater or less than the world price ratio. In contrast, a country might be legally on a gold standard but its banks (and government) have "suspended specie (gold) payments" (refusing to convert their notes into gold), so that the country is in fact on a "paper standard." The criterion adopted here is that a country is deemed on the gold standard if (1) gold is the predominant effective metallic money, or is the

monetary bullion, (2) specie payments are in force, and (3) there is a limitation on the coinage and/or the legal-tender status of silver (the only practical and historical competitor to gold), thus providing institutional or legal support for the effective gold standard emanating from (1) and (2).

Implications for Money Supply

Consider first the domestic gold standard. Under a pure coin standard, the gold in circulation, monetary base, and money supply are all one. With a mixed standard, the money supply is the product of the money multiplier (dependent on the commercial-banks' reserves/deposit and the nonbank-public's currency/deposit ratios) and the monetary base (the actual and potential reserves of the commercial banking system, with potential reserves held by the nonbank public). The monetary authority alters the monetary base by changing its gold holdings and its loans, discounts, and securities portfolio (non gold assets, called its "domestic assets"). However, the level of its domestic assets is dependent on its gold reserves, because the authority generates demand liabilities (notes and deposits) by increasing its assets, and convertibility of these liabilities must be supported by a gold reserve, if the gold standard is to be maintained. Therefore the gold standard provides a constraint on the level (or growth) of the money supply.

The international gold standard involves balance-of-payments surpluses settled by gold imports at the gold-import point, and deficits financed by gold exports at the gold-export point. (Within the spread, there are no gold flows and the balance of payments is in equilibrium.) The change in the money supply is then the product of the money multiplier and the gold flow, providing the monetary authority does not change its domestic assets. For a country on a gold- exchange standard, holdings of "foreign exchange" (the reserve currency) take the place of gold. In general, the "international assets" of a monetary authority may consist of both gold and foreign exchange.

The Classical Gold Standard

Dates of Countries Joining the Gold Standard

Table 1 (above) lists all countries that were on the classical gold standard, the gold- standard type to which each adhered, and the period(s) on the standard. Discussion here concentrates on the four core countries. For centuries, Britain was on an effective silver standard under legal bimetallism. The country switched to an effective gold standard early in the eighteenth century, solidified by the (mistakenly) gold-overvalued mint-price ratio established by Isaac Newton, Master of the Mint, in 1717. In 1774 the legal-tender property of silver was restricted, and Britain entered the gold standard in the full sense on that date. In 1798 coining of silver was suspended, and in 1816 the gold standard was formally adopted, ironically during a paper-standard regime (the "Bank Restriction Period," of 1797-1821), with the gold standard effectively resuming in 1821.

The United States was on an effective silver standard dating back to colonial times, legally bimetallic from 1786, and on an effective gold standard from 1834. The legal gold standard began in 1873-1874, when Acts ended silver-dollar coinage and limited legal tender of existing silver coins. Ironically, again the move from formal bimetallism to a legal gold standard occurred during a paper standard (the "greenback period," of 1861-1878), with a dual legal and effective gold standard from 1879.

International Shift to the Gold Standard

The rush to the gold standard occurred in the 1870s, with the adherence of Germany, the Scandinavian countries, France, and other European countries. Legal bimetallism shifted from effective silver to

effective gold monometallism around 1850, as gold discoveries in the United States and Australia resulted in overvalued gold at the mints. The gold/silver market situation subsequently reversed itself, and, to avoid a huge inflow of silver, many European countries suspended the coinage of silver and limited its legal-tender property. Some countries (France, Belgium, Switzerland) adopted a "limping" gold standard, in which existing former-standard silver coin retained full legal tender, permitting the monetary authority to redeem its notes in silver as well as gold.

As Table 1 shows, most countries were on a gold-coin (always meaning mixed) standard. The gold-bullion standard did not exist in the classical period (although in Britain that standard was embedded in legislation of 1819 that established a transition to restoration of the gold standard). A number of countries in the periphery were on a gold-exchange standard, usually because they were colonies or territories of a country on a gold-coin standard. In situations in which the periphery country lacked its own (even-coined) currency, the gold-exchange standard existed almost by default. Some countries — China, Persia, parts of Latin America — never joined the classical gold standard, instead retaining their silver or bimetallic standards.

Sources of Instability of the Classical Gold Standard

There were three elements making for instability of the classical gold standard. First, the use of foreign exchange as reserves increased as the gold standard progressed. Available end-of- year data indicate that, worldwide, foreign exchange in official reserves (the international assets of the monetary authority) increased by 36 percent from 1880 to 1899 and by 356 percent from 1899 to 1913. In comparison, gold in official reserves increased by 160 percent from 1880 to 1903 but only by 88 percent from 1903 to 1913. (Lindert, 1969, pp. 22, 25) While in 1913 only Germany among the center countries held any measurable amount of foreign exchange — 15 percent of total reserves excluding silver (which was of limited use) — the percentage for the rest of the world was double that for Germany (Table 6). If there were a rush to cash in foreign exchange for gold, reduction or depletion of the gold of reserve-currency countries could place the gold standard in jeopardy.

Table 6Share of Foreign Exchange in Official Reserves(end of year, percent)

Country	1928b
Excluding Silverb	
0	10
0	0c
0d	51
13	16
27	32

a Official reserves: gold, silver, and foreign exchange.
b Official reserves: gold and foreign exchange.
c Less than 0.05 percent.
d Less than 0.5 percent.

Sources: 1913 — Lindert (1969, pp. 10-11). 1928 — Britain: Board of Governors of the Federal Reserve System [cited as BG] (1943, p. 551), Sayers (1976, pp. 348, 352) for Bank of England dollar reserves (dated January 2, 1929). United States: BG (1943, pp. 331, 544), foreign exchange consisting of Federal Reserve Banks holdings of foreign-currency bills. France and Germany: Nurkse (1944, p. 234). Rest of world [computed as residual]: gold, BG (1943, pp. 544-51); foreign exchange, from "total" (Triffin, 1964, p. 66),

France, and Germany.

Second, Britain — the predominant reserve-currency country — was in a particularly sensitive situation. Again considering end-of 1913 data, almost half of world foreign-exchange reserves were in sterling, but the Bank of England had only three percent of world gold reserves (Tables 7-8). Defining the "reserve ratio" of the reserve-currency-country monetary authority as the ratio of (i) official reserves to (ii) liabilities to foreign monetary authorities held in financial institutions in the country, in 1913 this ratio was only 31 percent for the Bank of England, far lower than those of the monetary authorities of the other core countries (Table 9). An official run on sterling could easily force Britain off the gold standard. Because sterling was an international currency, private foreigners also held considerable liquid assets in London, and could themselves initiate a run on sterling.

Table 7Composition of World Official Foreign-Exchange Reserves(end of year, percent)

1913a	British pounds	77
2	French francs	}2}
		}
16		
5b		

a Excluding holdings for which currency unspecified.
b Primarily Dutch guilders and Scandinavian kroner.

Sources: 1913 — Lindert (1969, pp. 18-19). 1928 — Components of world total: Triffin (1964, pp. 22, 66), Sayers (1976, pp. 348, 352) for Bank of England dollar reserves (dated January 2, 1929), Board of Governors of the Federal Reserve System [cited as BG] (1943, p. 331) for Federal Reserve Banks holdings of foreign-currency bills.

Table 8Official-Reserves Components: Percent of World Total(end of year)

Country	1928			
Gold	Foreign Exchange			
0	7	United States	27	0a
0b	13	Germany	6	4
95	36			

Table 9Reserve Ratiosa of Reserve-Currency Countries (end of year)

Country	1928c
Excluding Silverc	
0.31	0.33
90.55	5.45
2.38	not available
2.11	not available

a Ratio of official reserves to official liquid liabilities (that is, liabilities to foreign governments and central

banks).
b Official reserves: gold, silver, and foreign exchange.
c Official reserves: gold and foreign exchange.

Sources : 1913 — Lindert (1969, pp. 10-11, 19). Foreign-currency holdings for which currency unspecified allocated proportionately to the four currencies based on known distribution. 1928 — Gold reserves: Board of Governors of the Federal Reserve System [cited as BG] (1943, pp. 544, 551). Foreign- exchange reserves: Sayers (1976, pp. 348, 352) for Bank of England dollar reserves (dated January 2, 1929); BG (1943, p. 331) for Federal Reserve Banks holdings of foreign-currency bills. Official liquid liabilities: Triffin (1964, p. 22), Sayers (1976, pp. 348, 352).

Third, the United States, though a center country, was a great source of instability to the gold standard. Its Treasury held a high percentage of world gold reserves (more than that of the three other core countries combined in 1913), resulting in an absurdly high reserve ratio — Tables 7-9). With no central bank and a decentralized banking system, financial crises were frequent. Far from the United States assisting Britain, gold often flowed from the Bank of England to the United States to satisfy increases in U.S. demand for money. Though in economic size the United States was the largest of the core countries, in many years it was a net importer rather than exporter of capital to the rest of the world — the opposite of the other core countries. The political power of silver interests and recurrent financial panics led to imperfect credibility in the U.S. commitment to the gold standard. Runs on banks and runs on the Treasury gold reserve placed the U.S. gold standard near collapse in the early and mid-1890s. During that period, the credibility of the Treasury's commitment to the gold standard was shaken. Indeed, the gold standard was saved in 1895 (and again in 1896) only by cooperative action of the Treasury and a bankers' syndicate that stemmed gold exports.

Rules of the Game

According to the "rules of the [gold-standard] game," central banks were supposed to reinforce, rather than "sterilize" (moderate or eliminate) or ignore, the effect of gold flows on the monetary supply. A gold outflow typically decreases the international assets of the central bank and thence the monetary base and money supply. The central-bank's proper response is: (1) raise its "discount rate," the central-bank interest rate for rediscounting securities (cashing, at a further deduction from face value, a short-term security from a financial institution that previously discounted the security), thereby inducing commercial banks to adopt a higher reserves/deposit ratio and therefore decreasing the money multiplier; and (2) decrease lending and sell securities, thereby decreasing domestic assets and thence the monetary base. On both counts the money supply is further decreased. Should the central bank rather increase its domestic assets when it loses gold, it engages in "sterilization" of the gold flow and is decidedly not following the "rules of the game." The converse argument (involving gold inflow and increases in the money supply) also holds, with sterilization involving the central bank decreasing its domestic assets when it gains gold.

Price Specie-Flow Mechanism

A country experiencing a balance-of-payments deficit loses gold and its money supply decreases, both automatically and by policy in accordance with the "rules of the game." Money income contracts and the price level falls, thereby increasing exports and decreasing imports. Similarly, a surplus country gains gold, the money supply increases, money income expands, the price level rises, exports decrease and imports increase. In each case, balance-of-payments equilibrium is restored via the current account.

This is called the “price specie-flow mechanism.” To the extent that wages and prices are inflexible, movements of real income in the same direction as money income occur; in particular, the deficit country suffers unemployment but the payments imbalance is nevertheless corrected.

The capital account also acts to restore balance, via interest-rate increases in the deficit country inducing a net inflow of capital. The interest-rate increases also reduce real investment and thence real income and imports. Similarly, interest-rate decreases in the surplus country elicit capital outflow and increase real investment, income, and imports. This process enhances the current-account correction of the imbalance.

One problem with the “rules of the game” is that, on “global-monetarist” theoretical grounds, they were inconsequential. Under fixed exchange rates, gold flows simply adjust money supply to money demand; the money supply is not determined by policy. Also, prices, interest rates, and incomes are determined worldwide. Even core countries can influence these variables domestically only to the extent that they help determine them in the global marketplace. Therefore the price-specie-flow and like mechanisms cannot occur. Historical data support this conclusion: gold flows were too small to be suggestive of these mechanisms; and prices, incomes, and interest rates moved closely in correspondence (rather than in the opposite directions predicted by the adjustment mechanisms induced by the “rules of the game”) — at least among non-periphery countries, especially the core group.

Discount Rate Rule and the Bank of England

However, the Bank of England did, in effect, manage its discount rate (“Bank Rate”) in accordance with rule (1). The Bank’s primary objective was to maintain convertibility of its notes into gold, that is, to preserve the gold standard, and its principal policy tool was Bank Rate. When its “liquidity ratio” of gold reserves to outstanding note liabilities decreased, it would usually increase Bank Rate. The increase in Bank Rate carried with it market short-term increase rates, inducing a short-term capital inflow and thereby moving the exchange rate away from the gold-export point by increasing the exchange value of the pound. The converse also held, with a rise in the liquidity ratio involving a Bank Rate decrease, capital outflow, and movement of the exchange rate away from the gold import point. The Bank was constantly monitoring its liquidity ratio, and in response altered Bank Rate almost 200 times over 1880- 1913.

While the Reichsbank (the German central bank), like the Bank of England, generally moved its discount rate inversely to its liquidity ratio, most other central banks often violated the rule, with changes in their discount rates of inappropriate direction, or of insufficient amount or frequency. The Bank of France, in particular, kept its discount rate stable. Unlike the Bank of England, it chose to have large gold reserves (see Table 8), with payments imbalances accommodated by fluctuations in its gold rather than financed by short-term capital flows. The United States, lacking a central bank, had no discount rate to use as a policy instrument.

Sterilization Was Dominant

As for rule (2), that the central-bank’s domestic and international assets move in the same direction; in fact the opposite behavior, sterilization, was dominant, as shown in Table 10. The Bank of England followed the rule more than any other central bank, but even so violated it more often than not! How then did the classical gold standard cope with payments imbalances? Why was it a stable system?

Table 10Annual Changes in Internationala and Domesticb Assets of
Central BankPercent of Changes in the Same Directionc

1880-1913d	Britain	33
__	France	33
31	British Dominionse	13
32	Scandinaviag	25
33	South Americai	23

a 1880-1913: Gold, silver and foreign exchange. 1922-1936: Gold and foreign exchange.
b Domestic income-earning assets: discounts, loans, securities.
c Implying country is following "rules of the game." Observations with zero or negligible changes in either class of assets excluded.
d Years when country is off gold standard excluded. See Tables 1 and 2.
e Australia and South Africa.
f1880-1913: Austria-Hungary, Belgium, and Netherlands. 1922-1936: Austria, Italy, Netherlands, and Switzerland.
g Denmark, Finland, Norway, and Sweden.
h1880-1913: Russia. 1922-1936: Bulgaria, Czechoslovakia, Greece, Hungary, Poland, Romania, and Yugoslavia.
I Chile, Colombia, Peru, and Uruguay.

Sources: Bloomfield (1959, p. 49), Nurkse (1944, p. 69).

The Stability of the Classical Gold Standard

The fundamental reason for the stability of the classical gold standard is that there was always absolute private-sector credibility in the commitment to the fixed domestic-currency price of gold on the part of the center country (Britain), two (France and Germany) of the three remaining core countries, and certain other European countries (Belgium, Netherlands, Switzerland, and Scandinavia). Certainly, that was true from the late-1870s onward. (For the United States, this absolute credibility applied from about 1900.) In earlier periods, that commitment had a contingency aspect: it was recognized that convertibility could be suspended in the event of dire emergency (such as war); but, after normal conditions were restored, convertibility would be re-established at the pre-existing mint price and gold contracts would again be honored. The Bank Restriction Period is an example of the proper application of the contingency, as is the greenback period (even though the United States, effectively on the gold standard, was legally on bimetallism).

Absolute Credibility Meant Zero Convertibility and Exchange Risk

The absolute credibility in countries' commitment to convertiblity at the existing mint price implied that there was extremely low, essentially zero, convertibility risk (the probability that Treasury or central-bank notes would not be redeemed in gold at the established mint price) and exchange risk (the probability that the mint parity between two currencies would be altered, or that exchange control or prohibition of gold export would be instituted).

Reasons Why Commitment to Convertibility Was So Credible

There were many reasons why the commitment to convertibility was so credible. (1) Contracts were expressed in gold; if convertibility were abandoned, contracts would inevitably be violated — an undesirable outcome for the monetary authority. (2) Shocks to the domestic and world economies were infrequent and generally mild. There was basically international peace and domestic calm.

(3) The London capital market was the largest, most open, most diversified in the world, and its gold market was also dominant. A high proportion of world trade was financed in sterling, London was the most important reserve-currency center, and balances of payments were often settled by transferring sterling assets rather than gold. Therefore sterling was an international currency — not merely supplemental to gold but perhaps better: a boon to non- center countries, because sterling involved positive, not zero, interest return and its transfer costs were much less than those of gold. Advantages to Britain were the charges for services as an international banker, differential interest returns on its financial intermediation, and the practice of countries on a sterling (gold-exchange) standard of financing payments surpluses with Britain by piling up short-term sterling assets rather than demanding Bank of England gold.

(4) There was widespread ideology — and practice — of "orthodox metallism," involving authorities' commitment to an anti-inflation, balanced-budget, stable-money policy. In particular, the ideology implied low government spending and taxes and limited monetization of government debt (financing of budget deficits by printing money). Therefore it was not expected that a country's price level or inflation would get out of line with that of other countries, with resulting pressure on the country's adherence to the gold standard. (5) This ideology was mirrored in, and supported by, domestic politics. Gold had won over silver and paper, and stable-money interests (bankers, industrialists, manufacturers, merchants, professionals, creditors, urban groups) over inflationary interests (farmers, landowners, miners, debtors, rural groups).

(6) There was freedom from government regulation and a competitive environment, domestically and internationally. Therefore prices and wages were more flexible than in other periods of human history (before and after). The core countries had virtually no capital controls; the center country (Britain) had adopted free trade, and the other core countries had moderate tariffs. Balance-of-payments financing and adjustment could proceed without serious impediments.

(7) Internal balance (domestic macroeconomic stability, at a high level of real income and employment) was an unimportant goal of policy. Preservation of convertibility of paper currency into gold would not be superseded as the primary policy objective. While sterilization of gold flows was frequent (see above), the purpose was more "meeting the needs of trade" (passive monetary policy) than fighting unemployment (active monetary policy).

(8) The gradual establishment of mint prices over time ensured that the implied mint parities (exchange rates) were in line with relative price levels; so countries joined the gold standard with exchange rates in equilibrium. (9) Current-account and capital-account imbalances tended to be offsetting for the core countries, especially for Britain. A trade deficit induced a gold loss and a higher interest rate, attracting a capital inflow and reducing capital outflow. Indeed, the capital- exporting core countries — Britain, France, and Germany — could eliminate a gold loss simply by reducing lending abroad.

Rareness of Violations of Gold Points

Many of the above reasons not only enhanced credibility in existing mint prices and parities but also kept international-payments imbalances, and hence necessary adjustment, of small magnitude. Responding to the essentially zero convertibility and exchange risks implied by the credible commitment, private agents further reduced the need for balance-of-payments adjustment via gold-point arbitrage (discussed above) and also via a specific kind of speculation. When the exchange rate moved beyond a gold point, arbitrage acted to return it to the spread. So it is not surprising that "violations of the gold points" were

rare on a monthly average basis, as demonstrated in Table 11 for the dollar, franc, and mark exchange rate versus sterling. Certainly, gold-point violations did occur; but they rarely persisted sufficiently to be counted on monthly average data. Such measured violations were generally associated with financial crises. (The number of dollar-sterling violations for 1890-1906 exceeding that for 1889-1908 is due to the results emanating from different researchers using different data. Nevertheless, the important common finding is the low percent of months encompassed by violations.)

Table 11Violations of Gold Points

Exchange Rate	Time Period	Number of Months	Number	
1890-1906	3	dollar-sterling	76	0
1889-1908	12b	mark-sterling	240	7.5
dollar-sterling	240	0.4		

a May 1925 August 1931: full months during which both United States and Britain on gold standard.
b Approximate number, deciphered from graph.

Sources: Dollar-sterling, 1890-1906 and 1925-1931 — Officer (1996, p. 235). All other — Giovannini (1993, pp. 130-31).

Stabilizing Speculation

The perceived extremely low convertibility and exchange risks gave private agents profitable opportunities not only outside the spread (gold-point arbitrage) but also within the spread (exchange-rate speculation). As the exchange value of a country's currency weakened, the exchange rate approaching the gold-export point, speculators had an ever greater incentive to purchase domestic currency with foreign currency (a capital inflow); for they had good reason to believe that the exchange rate would move in the opposite direction, whereupon they would reverse their transaction at a profit. Similarly, a strengthened currency, with the exchange rate approaching the gold-import point, involved speculators selling the domestic currency for foreign currency (a capital outflow). Clearly, the exchange rate would either not go beyond the gold point (via the actions of other speculators of the same ilk) or would quickly return to the spread (via gold-point arbitrage). Also, the further the exchange rate moved toward the gold point, the greater the potential profit opportunity; for there was a decreased distance to that gold point and an increased distance from the other point.

This "stabilizing speculation" enhanced the exchange value of depreciating currencies that were about to lose gold; and thus the gold loss could be prevented. The speculation was all the more powerful, because the absence of controls on capital movements meant private capital flows were highly responsive to exchange-rate changes. Dollar-sterling data, in Table 12, show that this speculation was extremely efficient in keeping the exchange rate away from the gold points — and increasingly effective over time. Interestingly, these statements hold even for the 1890s, during which at times U.S. maintenance of currency convertibility was precarious. The average deviation of the exchange rate from the midpoint of the spread fell decade-by-decade from about 1/3 of one percent of parity in 1881-1890 (23 percent of the gold-point spread) to only 12/100th of one percent of parity in 1911-1914 (11 percent of the spread).

Table 12Average Deviation of Dollar-Sterling
Exchange Rate from Gold-Point-Spread Midpoint

Percent of Parity	Quarterly observations

0.32	1891-1900	19
0.15	1911-1914a	11
0.28	Monthly observations	
0.24	1925-1931c	26

a Ending with second quarter of 1914.
b Third quarter 1925 second quarter 1931: full quarters during which both United States and Britain on gold standard.
c May 1925 August 1931: full months during which both United States and Britain on gold standard.

Source: Officer (1996, pp. 182, 191, 272).

Government Policies That Enhanced Gold-Standard Stability

Government policies also enhanced gold-standard stability. First, by the turn of the century South Africa — the main world gold producer — sold all its gold in London, either to private parties or actively to the Bank of England, with the Bank serving also as residual purchaser of the gold. Thus the Bank had the means to replenish its gold reserves. Second, the orthodox- metallism ideology and the leadership of the Bank of England — other central banks would often gear their monetary policy to that of the Bank — kept monetary policies harmonized. Monetary discipline was maintained.

Third, countries used "gold devices," primarily the manipulation of gold points, to affect gold flows. For example, the Bank of England would foster gold imports by lowering the foreign gold-export point (number of units of foreign currency per pound, the British gold-import point) through interest-free loans to gold importers or raising its purchase price for bars and foreign coin. The Bank would discourage gold exports by lowering the foreign gold-import point (the British gold-export point) via increasing its selling prices for gold bars and foreign coin, refusing to sell bars, or redeeming its notes in underweight domestic gold coin. These policies were alternative to increasing Bank Rate.

The Bank of France and Reichsbank employed gold devices relative to discount-rate changes more than Britain did. Some additional policies included converting notes into gold only in Paris or Berlin rather than at branches elsewhere in the country, the Bank of France converting its notes in silver rather than gold (permitted under its "limping" gold standard), and the Reichsbank using moral suasion to discourage the export of gold. The U.S. Treasury followed similar policies at times. In addition to providing interest-free loans to gold importers and changing the premium at which it would sell bars (or refusing to sell bars outright), the Treasury condoned banking syndicates to put pressure on gold arbitrageurs to desist from gold export in 1895 and 1896, a time when the U.S. adherence to the gold standard was under stress.

Fourth, the monetary system was adept at conserving gold, as evidenced in Table 3. This was important, because the increased gold required for a growing world economy could be obtained only from mining or from nonmonetary hoards. While the money supply for the eleven- major-country aggregate more than tripled from 1885 to 1913, the percent of the money supply in the form of metallic money (gold and silver) more than halved. This process did not make the gold standard unstable, because gold moved into commercial-bank and central-bank (or Treasury) reserves: the ratio of gold in official reserves to official plus money gold increased from 33 to 54 percent. The relative influence of the public versus private sector in reducing the proportion of metallic money in the money supply is an issue warranting exploration by monetary historians.

Fifth, while not regular, central-bank cooperation was not generally required in the stable environment in which the gold standard operated. Yet this cooperation was forthcoming when needed, that is, during financial crises. Although Britain was the center country, the precarious liquidity position of the Bank of England meant that it was more often the recipient than the provider of financial assistance. In crises, it would obtain loans from the Bank of France (also on occasion from other central banks), and the Bank of France would sometimes purchase sterling to push up that currency's exchange value. Assistance also went from the Bank of England to other central banks, as needed. Further, the credible commitment was so strong that private bankers did not hesitate to make loans to central banks in difficulty.

In sum, "virtuous" two-way interactions were responsible for the stability of the gold standard. The credible commitment to convertibility of paper money at the established mint price, and therefore the fixed mint parities, were both a cause and a result of (1) the stable environment in which the gold standard operated, (2) the stabilizing behavior of arbitrageurs and speculators, and (3) the responsible policies of the authorities — and (1), (2), and (3), and their individual elements, also interacted positively among themselves.

Experience of Periphery

An important reason for periphery countries to join and maintain the gold standard was the access to the capital markets of the core countries thereby fostered. Adherence to the gold standard connoted that the peripheral country would follow responsible monetary, fiscal, and debt-management policies — and, in particular, faithfully repay the interest on and principal of debt. This "good housekeeping seal of approval" (the term coined by Bordo and Rockoff, 1996), by reducing the risk premium, involved a lower interest rate on the country's bonds sold abroad, and very likely a higher volume of borrowing. The favorable terms and greater borrowing enhanced the country's economic development.

However, periphery countries bore the brunt of the burden of adjustment of payments imbalances with the core (and other Western European) countries, for three reasons. First, some of the periphery countries were on a gold-exchange standard. When they ran a surplus, they typically increased — and with a deficit, decreased — their liquid balances in London (or other reserve-currency country) rather than withdraw gold from the reserve-currency country. The monetary base of the periphery country would increase, or decrease, but that of the reserve-currency country would remain unchanged. This meant that such changes in domestic variables — prices, incomes, interest rates, portfolios, etc.–that occurred to correct the surplus or deficit, were primarily in the periphery country. The periphery, rather than the core, "bore the burden of adjustment."

Second, when Bank Rate increased, London drew funds from France and Germany, that attracted funds from other Western European and Scandinavian countries, that drew capital from the periphery. Also, it was easy for a core country to correct a deficit by reducing lending to, or bringing capital home from, the periphery. Third, the periphery countries were underdeveloped; their exports were largely primary products (agriculture and mining), which inherently were extremely sensitive to world market conditions. This feature made adjustment in the periphery compared to the core take the form more of real than financial correction. This conclusion also follows from the fact that capital obtained from core countries for the purpose of economic development was subject to interruption and even reversal. While the periphery was probably better off with access to the capital than in isolation, its welfare gain was reduced by the instability of capital import.

The experience on adherence to the gold standard differed among periphery groups. The important

British dominions and colonies — Australia, New Zealand, Canada, and India — successfully maintained the gold standard. They were politically stable and, of course, heavily influenced by Britain. They paid the price of serving as an economic cushion to the Bank of England's financial situation; but, compared to the rest of the periphery, gained a relatively stable long-term capital inflow. In undeveloped Latin American and Asia, adherence to the gold standard was fragile, with lack of complete credibility in the commitment to convertibility. Many of the reasons for credible commitment that applied to the core countries were absent — for example, there were powerful inflationary interests, strong balance-of-payments shocks, and rudimentary banking sectors. For Latin America and Asia, the cost of adhering to the gold standard was very apparent: loss of the ability to depreciate the currency to counter reductions in exports. Yet the gain, in terms of a steady capital inflow from the core countries, was not as stable or reliable as for the British dominions and colonies.

The Breakdown of the Classical Gold Standard

The classical gold standard was at its height at the end of 1913, ironically just before it came to an end. The proximate cause of the breakdown of the classical gold standard was political: the advent of World War I in August 1914. However, it was the Bank of England's precarious liquidity position and the gold-exchange standard that were the underlying cause. With the outbreak of war, a run on sterling led Britain to impose extreme exchange control — a postponement of both domestic and international payments — that made the international gold standard non-operational. Convertibility was not legally suspended; but moral suasion, legalistic action, and regulation had the same effect. Gold exports were restricted by extralegal means (and by Trading with the Enemy legislation), with the Bank of England commandeering all gold imports and applying moral suasion to bankers and bullion brokers.

Almost all other gold-standard countries undertook similar policies in 1914 and 1915. The United States entered the war and ended its gold standard late, adopting extralegal restrictions on convertibility in 1917 (although in 1914 New York banks had temporarily imposed an informal embargo on gold exports). An effect of the universal removal of currency convertibility was the ineffectiveness of mint parities and inapplicability of gold points: floating exchange rates resulted.

Interwar Gold Standard

Return to the Gold Standard

In spite of the tremendous disruption to domestic economies and the worldwide economy caused by World War I, a general return to gold took place. However, the resulting interwar gold standard differed institutionally from the classical gold standard in several respects. First, the new gold standard was led not by Britain but rather by the United States. The U.S. embargo on gold exports (imposed in 1917) was removed in 1919, and currency convertibility at the prewar mint price was restored in 1922. The gold value of the dollar rather than of the pound sterling would typically serve as the reference point around which other currencies would be aligned and stabilized. Second, it follows that the core would now have two center countries, the United Kingdom and the United States.

Third, for many countries there was a time lag between stabilizing a country's currency in the foreign-exchange market (fixing the exchange rate or mint parity) and resuming currency convertibility. Given a lag, the former typically occurred first, currency stabilization operating via central-bank intervention in the foreign-exchange market (transacting in the domestic currency and a reserve currency, generally sterling or the dollar). Table 2 presents the dates of exchange- rate stabilization and currency convertibility resumption for the countries on the interwar gold standard. It is fair to say that the

interwar gold standard was at its height at the end of 1928, after all core countries were fully on the standard and before the Great Depression began.

Fourth, the contingency aspect of convertibility conversion, that required restoration of convertibility at the mint price that existed prior to the emergency (World War I), was broken by various countries — even core countries. Some countries (including the United States, United Kingdom, Denmark, Norway, Netherlands, Sweden, Switzerland, Australia, Canada, Japan, Argentina) stabilized their currencies at the prewar mint price. However, other countries (France, Belgium, Italy, Portugal, Finland, Bulgaria, Romania, Greece, Chile) established a gold content of their currency that was a fraction of the prewar level: the currency was devalued in terms of gold, the mint price was higher than prewar. A third group of countries (Germany, Austria, Hungary) stabilized new currencies adopted after hyperinflation. A fourth group (Czechoslovakia, Danzig, Poland, Estonia, Latvia, Lithuania) consisted of countries that became independent or were created following the war and that joined the interwar gold standard. A fifth group (some Latin American countries) had been on silver or paper standards during the classical period but went on the interwar gold standard. A sixth country group (Russia) had been on the classical gold standard, but did not join the interwar gold standard. A seventh group (Spain, China, Iran) joined neither gold standard.

The fifth way in which the interwar gold standard diverged from the classical experience was the mix of gold-standard types. As Table 2 shows, the gold coin standard, dominant in the classical period, was far less prevalent in the interwar period. In particular, all four core countries had been on coin in the classical gold standard; but, of them, only the United States was on coin interwar. The gold-bullion standard, nonexistent prewar, was adopted by two core countries (United Kingdom and France) as well as by two Scandinavian countries (Denmark and Norway). Most countries were on a gold-exchange standard. The central banks of countries on the gold-exchange standard would convert their currencies not into gold but rather into “gold-exchange” currencies (currencies themselves convertible into gold), in practice often sterling, sometimes the dollar (the reserve currencies).

Instability of the Interwar Gold Standard

The features that fostered stability of the classical gold standard did not apply to the interwar standard; instead, many forces made for instability. (1) The process of establishing fixed exchange rates was piecemeal and haphazard, resulting in disequilibrium exchange rates. The United Kingdom restored convertibility at the prewar mint price without sufficient deflation, resulting in an overvalued currency of about ten percent. (Expressed in a common currency at mint parity, the British price level was ten percent higher than that of its trading partners and competitors). A depressed export sector and chronic balance-of-payments difficulties were to result. Other overvalued currencies (in terms of mint parity) were those of Denmark, Italy, and Norway. In contrast, France, Germany, and Belgium had undervalued currencies. (2) Wages and prices were less flexible than in the prewar period. In particular, powerful unions kept wages and unemployment high in British export industries, hindering balance-of-payments correction.

(3) Higher trade barriers than prewar also restrained adjustment.

(4) The gold-exchange standard economized on total world gold via the gold of reserve- currency countries backing their currencies in their reserves role for countries on that standard and also for countries on a coin or bullion standard that elected to hold part of their reserves in London or New York. (Another economizing element was continuation of the move of gold out of the money supply and

into banking and official reserves that began in the classical period: for the eleven-major-country aggregate, gold declined to less than œ of one percent of the money supply in 1928, and the ratio of official gold to official-plus-money gold reached 99 percent — Table 3). The gold-exchange standard was inherently unstable, because of the conflict between (a) the expansion of sterling and dollar liabilities to foreign central banks to expand world liquidity, and (b) the resulting deterioration in the reserve ratio of the Bank of England, and U.S. Treasury and Federal Reserve Banks.

This instability was particularly severe in the interwar period, for several reasons. First, France was now a large official holder of sterling, with over half the official reserves of the Bank of France in foreign exchange in 1928, versus essentially none in 1913 (Table 6); and France was resentful that the United Kingdom had used its influence in the League of Nations to induce financially reconstructed countries in Europe to adopt the gold-exchange (sterling) standard. Second, many more countries were on the gold-exchange standard than prewar. Cooperation in restraining a run on sterling or the dollar would be difficult to achieve. Third, the gold-exchange standard, associated with colonies in the classical period, was viewed as a system inferior to a coin standard.

(5) In the classical period, London was the one dominant financial center; in the interwar period it was joined by New York and, in the late 1920s, Paris. Both private and official holdings of foreign currency could shift among the two or three centers, as interest-rate differentials and confidence levels changed.

(6) The problem with gold was not overall scarcity but rather maldistribution. In 1928, official reserve-currency liabilities were much more concentrated than in 1913: the United Kingdom accounted for 77 percent of world foreign-exchange reserves and France less than two percent (versus 47 and 30 percent in 1913 — Table 7). Yet the United Kingdom held only seven percent of world official gold and France 13 percent (Table 8). Reflecting its undervalued currency, France also possessed 39 percent of world official foreign exchange. Incredibly, the United States held 37 percent of world official gold — more than all the non-core countries together.

(7) Britain's financial position was even more precarious than in the classical period. In 1928, the gold and dollar reserves of the Bank of England covered only one third of London's liquid liabilities to official foreigners, a ratio hardly greater than in 1913 (and compared to a U.S. ratio of almost 5œ — Table 9). Various elements made the financial position difficult compared to prewar. First, U.K. liquid liabilities were concentrated on stronger countries (France, United States), whereas its liquid assets were predominantly in weaker countries (such as Germany). Second, there was ongoing tension with France, that resented the sterling-dominated gold- exchange standard and desired to cash in its sterling holding for gold to aid its objective of achieving first-class financial status for Paris.

(8) Internal balance was an important goal of policy, which hindered balance-of-payments adjustment, and monetary policy was affected greatly by domestic politics rather than geared to preservation of currency convertibility. (9) Especially because of (8), the credibility in authorities' commitment to the gold standard was not absolute. Convertibility risk and exchange risk could be well above zero, and currency speculation could be destabilizing rather than stabilizing; so that when a country's currency approached or reached its gold-export point, speculators might anticipate that currency convertibility would not be maintained and the currency devalued. Hence they would sell rather than buy the currency, which, of course, would help bring about the very outcome anticipated.

(10) The "rules of the game" were infrequently followed and, for most countries, violated even more often than in the classical gold standard — Table 10. Sterilization of gold inflows by the Bank of England

can be viewed as an attempt to correct the overvalued pound by means of deflation. However, the U.S. and French sterilization of their persistent gold inflows reflected exclusive concern for the domestic economy and placed the burden of adjustment on other countries in the form of deflation.

(11) The Bank of England did not provide a leadership role in any important way, and central-bank cooperation was insufficient to establish credibility in the commitment to currency convertibility.

Breakdown of the Interwar Gold Standard

Although Canada effectively abandoned the gold standard early in 1929, this was a special case in two respects. First, the action was an early drastic reaction to high U.S. interest rates established to fight the stock-market boom but that carried the threat of unsustainable capital outflow and gold loss for other countries. Second, use of gold devices was the technique used to restrict gold exports and informally terminate the Canadian gold standard.

The beginning of the end of the interwar gold standard occurred with the Great Depression. The depression began in the periphery, with low prices for exports and debt-service requirements leading to insurmountable balance-of-payments difficulties while on the gold standard. However, U.S. monetary policy was an important catalyst. In the second half of 1927 the Federal Reserve pursued an easy-money policy, which supported foreign currencies but also fed the boom in the New York stock market. Reversing policy to fight the Wall Street boom, higher interest rates attracted monies to New York, which weakened sterling in particular. The stock market crash in October 1929, while helpful to sterling, was followed by a passive monetary policy that did not prevent the U.S. depression that started shortly thereafter and that spread to the rest of the world via declines in U.S. trade and lending. In 1929 and 1930 a number of periphery countries either formally suspended currency convertibility or restricted it so that their currencies went beyond the gold-export point.

It was destabilizing speculation, emanating from lack of confidence in authorities' commitment to currency convertibility that ended the interwar gold standard. In May 1931 there was a run on Austria's largest commercial bank, and the bank failed. The run spread to Germany, where an important bank also collapsed. The countries' central banks lost substantial reserves; international financial assistance was too late; and in July 1931 Germany adopted exchange control, followed by Austria in October. These countries were definitively off the gold standard.

The Austrian and German experiences, as well as British budgetary and political difficulties, were among the factors that destroyed confidence in sterling, which occurred in mid-July 1931. Runs on sterling ensued, and the Bank of England lost much of its reserves. Loans from abroad were insufficient, and in any event taken as a sign of weakness. The gold standard was abandoned in September, and the pound quickly and sharply depreciated on the foreign- exchange market, as overvaluation of the pound would imply.

Amazingly, there were no violations of the dollar-sterling gold points on a monthly average basis to the very end of August 1931 (Table 11). In contrast, the average deviation of the dollar-sterling exchange rate from the midpoint of the gold-point spread in 1925-1931 was more than double that in 1911-1914, by either of two measures (Table 12), suggesting less- dominant stabilizing speculation compared to the prewar period. Yet the 1925-1931 average deviation was not much more (in one case, even less) than in earlier decades of the classical gold standard. The trust in the Bank of England had a long tradition, and the shock to confidence in sterling that occurred in July 1931 was unexpected by the British authorities.

Following the U.K. abandonment of the gold standard, many countries followed, some to maintain their competitiveness via currency devaluation, others in response to destabilizing capital flows. The United States held on until 1933, when both domestic and foreign demands for gold, manifested in runs on U.S. commercial banks, became intolerable. The "gold bloc" countries (France, Belgium, Netherlands, Switzerland, Italy, Poland) and Danzig lasted even longer; but, with their currencies now overvalued and susceptible to destabilizing speculation, these countries succumbed to the inevitable by the end of 1936. Albania stayed on gold until occupied by Italy in 1939. As much as a cause, the Great Depression was a consequence of the gold standard; for gold-standard countries hesitated to inflate their economies for fear of weakening the balance of payments, suffering loss of gold and foreign-exchange reserves, and being forced to abandon convertibility or the gold parity. So the gold standard involved "golden fetters" (the title of the classic work of Eichengreen, 1992) that inhibited monetary and fiscal policy to fight the depression. Therefore, some have argued, these fetters seriously exacerbated the severity of the Great Depression within countries (because expansionary policy to fight unemployment was not adopted) and fostered the international transmission of the Depression (because as a country's output decreased, its imports fell, thus reducing exports and income of other countries).

The "international gold standard," defined as the period of time during which all four core countries were on the gold standard, existed from 1879 to 1914 (36 years) in the classical period and from 1926 or 1928 to 1931 (four or six years) in the interwar period. The interwar gold standard was a dismal failure in longevity, as well as in its association with the greatest depression the world has known.

References

Bayoumi, Tamim, Barry Eichengreen, and Mark P. Taylor, eds. *Modern Perspectives on the Gold Standard*. Cambridge: Cambridge University Press, 1996.

Bernanke, Ben, and Harold James. "The Gold Standard, Deflation, and Financial Crisis in the Great Depression: An International Comparison." In *Financial Market and Financial Crises*, edited by R. Glenn Hubbard, 33-68. Chicago: University of Chicago Press, 1991.

Bett, Virgil M. *Central Banking in Mexico: Monetary Policies and Financial Crises, 1864-1940*. Ann Arbor: University of Michigan, 1957.

Bloomfield, Arthur I. *Monetary Policy under the International Gold Standard, 1880 1914*. New York: Federal Reserve Bank of New York, 1959.

Bloomfield, Arthur I. *Short-Term Capital Movements Under the Pre-1914 Gold Standard*. Princeton: International Finance Section, Princeton University, 1963.

Board of Governors of the Federal Reserve System. *Banking and Monetary Statistics, 1914-1941*. Washington, DC, 1943.

Bordo, Michael D. "The Classical Gold Standard: Some Lessons for Today." Federal Reserve Bank of St. Louis *Review* 63, no. 5 (1981): 2-17.

Bordo, Michael D. "The Classical Gold Standard: Lessons from the Past." In *The International Monetary System: Choices for the Future*, edited by Michael B. Connolly, 229-65. New York: Praeger, 1982.

Bordo, Michael D. "Gold Standard: Theory." In *The New Palgrave Dictionary of Money & Finance*, vol. 2, edited by Peter Newman, Murray Milgate, and John Eatwell, 267 71. London: Macmillan, 1992.

Bordo, Michael D. “The Gold Standard, Bretton Woods and Other Monetary Regimes: A Historical Appraisal.” Federal Reserve Bank of St. Louis *Review* 75, no. 2 (1993): 123-91.

Bordo, Michael D. *The Gold Standard and Related Regimes: Collected Essays*. Cambridge: Cambridge University Press, 1999.

Bordo, Michael D., and Forrest Capie, eds. *Monetary Regimes in Transition*. Cambridge: Cambridge University Press, 1994.

Bordo, Michael D., and Barry Eichengreen, eds. *A Retrospective on the Bretton Woods System: Lessons for International Monetary Reform*. Chicago: University of Chicago Press, 1993.

Bordo, Michael D., and Finn E. Kydland. “The Gold Standard as a Rule: An Essay in Exploration.” *Explorations in Economic History* 32, no. 4 (1995): 423-64.

Bordo, Michael D., and Hugh Rockoff. “The Gold Standard as a ‘Good Housekeeping Seal of Approval’. ” *Journal of Economic History* 56, no. 2 (1996): 389- 428.

Bordo, Michael D., and Anna J. Schwartz, eds. *A Retrospective on the Classical Gold Standard, 1821-1931*. Chicago: University of Chicago Press, 1984.

Bordo, Michael D., and Anna J. Schwartz. “The Operation of the Specie Standard: Evidence for Core and Peripheral Countries, 1880-1990.” In *Currency Convertibility: The Gold Standard and Beyond*, edited by Jorge Braga de Macedo, Barry Eichengreen, and Jaime Reis, 11-83. London: Routledge, 1996.

Bordo, Michael D., and Anna J. Schwartz. “Monetary Policy Regimes and Economic Performance: The Historical Record.” In *Handbook of Macroeconomics*, vol. 1A, edited by John B. Taylor and Michael Woodford, 149-234. Amsterdam: Elsevier, 1999.

Broadberry, S. N., and N. F. R. Crafts, eds. *Britain in the International Economy*. Cambridge: Cambridge University Press, 1992.

Brown, William Adams, Jr. *The International Gold Standard Reinterpreted, 1914- 1934*. New York: National Bureau of Economic Research, 1940.

Bureau of the Mint. *Monetary Units and Coinage Systems of the Principal Countries of the World, 1929*. Washington, DC: Government Printing Office, 1929.

Cairncross, Alec, and Barry Eichengreen. *Sterling in Decline: The Devaluations of 1931, 1949 and 1967*. Oxford: Basil Blackwell, 1983.

Calleo, David P. “The Historiography of the Interwar Period: Reconsiderations.” In *Balance of Power or Hegemony: The Interwar Monetary System*, edited by Benjamin M. Rowland, 225-60. New York: New York University Press, 1976.

Clarke, Stephen V. O. *Central Bank Cooperation: 1924-31*. New York: Federal Reserve Bank of New York, 1967.

Cleveland, Harold van B. “The International Monetary System in the Interwar Period.” In *Balance of Power or Hegemony: The Interwar Monetary System*, edited by Benjamin M. Rowland, 1-59. New York: New York University Press, 1976.

Cooper, Richard N. “The Gold Standard: Historical Facts and Future Prospects.” *Brookings Papers on*

Economic Activity 1 (1982): 1-45.

Dam, Kenneth W. *The Rules of the Game: Reform and Evolution in the International Monetary System*. Chicago: University of Chicago Press, 1982.

De Cecco, Marcello. *The International Gold Standard*. New York: St. Martin's Press, 1984.

De Cecco, Marcello. "Gold Standard." In *The New Palgrave Dictionary of Money & Finance*, vol. 2, edited by Peter Newman, Murray Milgate, and John Eatwell, 260 66. London: Macmillan, 1992.

De Cecco, Marcello. "Central Bank Cooperation in the Inter-War Period: A View from the Periphery." In *International Monetary Systems in Historical Perspective*, edited by Jaime Reis, 113-34. Houndmills, Basingstoke, Hampshire: Macmillan, 1995.

De Macedo, Jorge Braga, Barry Eichengreen, and Jaime Reis, eds. *Currency Convertibility: The Gold Standard and Beyond*. London: Routledge, 1996.

Ding, Chiang Hai. "A History of Currency in Malaysia and Singapore." In *The Monetary System of Singapore and Malaysia: Implications of the Split Currency*, edited by J. Purcal, 1-9. Singapore: Stamford College Press, 1967.

Director of the Mint. *The Monetary Systems of the Principal Countries of the World, 1913*. Washington: Government Printing Office, 1913.

Director of the Mint. *Monetary Systems of the Principal Countries of the World, 1916*. Washington: Government Printing Office, 1917.

Dos Santos, Fernando Teixeira. "Last to Join the Gold Standard, 1931." In *Currency Convertibility: The Gold Standard and Beyond*, edited by Jorge Braga de Macedo, Barry Eichengreen, and Jaime Reis, 182-203. London: Routledge, 1996.

Dowd, Kevin, and Richard H. Timberlake, Jr., eds. *Money and the National State: The Financial Revolution, Government and the World Monetary System*. New Brunswick (U.S.): Transaction, 1998.

Drummond, Ian. M. *The Gold Standard and the International Monetary System, 1900 1939*. Houndmills, Basingstoke, Hampshire: Macmillan, 1987.

Easton, H. T. *Tate's Modern Cambist*. London: Effingham Wilson, 1912.

Eichengreen, Barry, ed. *The Gold Standard in Theory and History*. New York: Methuen, 1985.

Eichengreen, Barry. *Elusive Stability: Essays in the History of International Finance, 1919-1939*. New York: Cambridge University Press, 1990.

Eichengreen, Barry. "International Monetary Instability between the Wars: Structural Flaws or Misguided Policies?" In *The Evolution of the International Monetary System: How can Efficiency and Stability Be Attained?* edited by Yoshio Suzuki, Junichi Miyake, and Mitsuaki Okabe, 71-116. Tokyo: University of Tokyo Press, 1990.

Eichengreen, Barry. *Golden Fetters: The Gold Standard and the Great Depression, 1919 1939*. New York: Oxford University Press, 1992.

Eichengreen, Barry. "The Endogeneity of Exchange-Rate Regimes." In *Understanding Interdependence: The Macroeconomics of the Open Economy*, edited by Peter B. Kenen, 3-33. Princeton: Princeton

University Press, 1995.

Eichengreen, Barry. “History of the International Monetary System: Implications for Research in International Macroeconomics and Finance.” In *The Handbook of International Macroeconomics*, edited by Frederick van der Ploeg, 153-91. Cambridge, MA: Basil Blackwell, 1994.

Eichengreen, Barry, and Marc Flandreau. *The Gold Standard in Theory and History*, second edition. London: Routledge, 1997.

Einzig, Paul. *International Gold Movements*. London: Macmillan, 1929. *Federal Reserve Bulletin*, various issues, 1928-1936.

Ford, A. G. *The Gold Standard 1880-1914: Britain and Argentina*. Oxford: Clarendon Press, 1962.

Ford, A. G. “Notes on the Working of the Gold Standard before 1914.” In *The Gold Standard in Theory and History*, edited by Barry Eichengreen, 141-65. New York: Methuen, 1985.

Ford, A. G. “International Financial Policy and the Gold Standard, 1870-1914.” In *The Industrial Economies: The Development of Economic and Social Policies, The Cambridge Economic History of Europe*, vol. 8, edited by Peter Mathias and Sidney Pollard, 197-249. Cambridge: Cambridge University Press, 1989.

Frieden, Jeffry A. “The Dynamics of International Monetary Systems: International and Domestic Factors in the Rise, Reign, and Demise of the Classical Gold Standard.” In *Coping with Complexity in the International System*, edited by Jack Snyder and Robert Jervis, 137-62. Boulder, CO: Westview, 1993.

Friedman, Milton, and Anna Jacobson Schwartz. *A Monetary History of the United States, 1867-1960*. Princeton: Princeton University, Press, 1963.

Gallarotti, Giulio M. *The Anatomy of an International Monetary Regime: The Classical Gold Standard, 1880-1914*. New York: Oxford University Press, 1995.

Giovannini, Alberto. “Bretton Woods and its Precursors: Rules versus Discretion in the History of International Monetary Regimes.” In *A Retrospective on the Bretton Woods System: Lessons for International Monetary Reform*, edited by Michael D. Bordo and Barry Eichengreen, 109-47. Chicago: University of Chicago Press, 1993.

Gunasekera, H. A. de S. *From Dependent Currency to Central Banking in Ceylon: An Analysis of Monetary Experience, 1825-1957*. London: G. Bell, 1962.

Hawtrey, R. G. *The Gold Standard in Theory and Practice*, fifth edition. London: Longmans, Green, 1947.

Hawtrey, R. G. *Currency and Credit*, fourth edition. London: Longmans, Green, 1950.

Hershlag, Z. Y. *Introduction to the Modern Economic History of the Middle East*. London: E. J. Brill, 1980.

Ingram, James C. *Economic Changes in Thailand, 1850-1970*. Stanford, CA: Stanford University, 1971.

Jonung, Lars. “Swedish Experience under the Classical Gold Standard, 1873-1914.” In *A Retrospective on the Classical Gold Standard, 1821-1931*, edited by Michael D. Bordo and Anna J. Schwartz, 361-99. Chicago: University of Chicago Press, 1984.

Kemmerer, Donald L. “Statement.” In *Gold Reserve Act Amendments*, Hearings, U.S. Senate, 83rd Cong., second session, pp. 299-302. Washington, DC: Government Printing Office, 1954.

Kemmerer, Edwin Walter. *Modern Currency Reforms: A History and Discussion of Recent Currency Reforms in India, Puerto Rico, Philippine Islands, Straits Settlements and Mexico*. New York: Macmillan, 1916.

Kemmerer, Edwin Walter. *Inflation and Revolution: Mexico's Experience of 1912- 1917*. Princeton: Princeton University Press, 1940.

Kemmerer, Edwin Walter. *Gold and the Gold Standard: The Story of Gold Money – – Past, Present and Future*. New York: McGraw-Hill, 1944.

Kenwood, A.G., and A. L. Lougheed. *The Growth of the International Economy, 1820 1960*. London: George Allen & Unwin, 1971.

Kettell, Brian. *Gold*. Cambridge, MA: Ballinger, 1982.

Kindleberger, Charles P. A Financial History of Western Europe. London: George Allen & Unwin, 1984.

Kindleberger, Charles P. *The World in Depression, 1929-1939*, revised edition. Berkeley, University of California Press, 1986.

Lampe, John R. *The Bulgarian Economy in the Twentieth Century*. London: Croom Helm, 1986.

League of Nations. *Memorandum on Currency and Central Banks, 1913-1925*, second edition, vol. 1. Geneva, 1926.

League of Nations. *International Statistical Yearbook, 1926*. Geneva, 1927.

League of Nations. *International Statistical Yearbook, 1928*. Geneva, 1929.

League of Nations. *Statistical Yearbook, 1930/31*.Geneva, 1931.

League of Nations. *Money and Banking, 1937/38*, vol. 1: *Monetary Review*. Geneva.

League of Nations. *The Course and Control of Inflation*. Geneva, 1946.

Lindert, Peter H. *Key Currencies and Gold, 1900-1913*. Princeton: International Finance Section, Princeton University, 1969.

McCloskey, Donald N., and J. Richard Zecher. "How the Gold Standard Worked, 1880 1913." In *The Monetary Approach to the Balance of Payments*, edited by Jacob A. Frenkel and Harry G. Johnson, 357-85. Toronto: University of Toronto Press, 1976.

MacKay, R. A., ed. *Newfoundland: Economic Diplomatic, and Strategic Studies*. Toronto: Oxford University Press, 1946.

MacLeod, Malcolm. *Kindred Countries: Canada and Newfoundland before Confederation*. Ottawa: Canadian Historical Association, 1994.

Moggridge, D. E. *British Monetary Policy, 1924-1931: The Norman Conquest of $4.86*. Cambridge: Cambridge University Press, 1972.

Moggridge, D. E. "The Gold Standard and National Financial Policies, 1919-39." In *The Industrial Economies: The Development of Economic and Social Policies, The Cambridge Economic History of Europe*, vol. 8, edited by Peter Mathias and Sidney Pollard, 250-314. Cambridge: Cambridge University

Press, 1989.

Morgenstern, Oskar. *International Financial Transactions and Business Cycles*. Princeton: Princeton University Press, 1959.

Norman, John Henry. *Complete Guide to the World's Twenty-nine Metal Monetary Systems*. New York: G. P. Putnam, 1892.

Nurkse, Ragnar. *International Currency Experience: Lessons of the Inter-War Period*. Geneva: League of Nations, 1944.

Officer, Lawrence H. *Between the Dollar-Sterling Gold Points: Exchange Rates, Parity, and Market Behavior*. Cambridge: Cambridge University Press, 1996.

Pablo, Martín Acena, and Jaime Reis, eds. *Monetary Standards in the Periphery: Paper, Silver and Gold, 1854-1933*. Houndmills, Basingstoke, Hampshire: Macmillan, 2000.

Palyi, Melchior. *The Twilight of Gold, 1914-1936: Myths and Realities*. Chicago: Henry Regnery, 1972.

Pamuk, Sevket. *A Monetary History of the Ottoman Empire*. Cambridge: Cambridge University Press, 2000.

Pani?, M. *European Monetary Union: Lessons from the Classical Gold Standard*. Houndmills, Basingstoke, Hampshire: St. Martin's Press, 1992.

Powell, James. *A History of the Canadian Dollar*. Ottawa: Bank of Canada, 1999.

Redish, Angela. *Bimetallism: An Economic and Historical Analysis*. Cambridge: Cambridge University Press, 2000.

Rifaat, Mohammed Ali. *The Monetary System of Egypt: An Inquiry into its History and Present Working*. London: George Allen & Unwin, 1935.

Rockoff, Hugh. "Gold Supply." In *The New Palgrave Dictionary of Money & Finance*, vol. 2, edited by Peter Newman, Murray Milgate, and John Eatwell, 271 73. London: Macmillan, 1992.

Sayers, R. S. *The Bank of England*, 1891-1944, Appendixes. Cambridge: Cambridge University Press, 1976.

Sayers, R. S. *The Bank of England, 1891-1944*. Cambridge: Cambridge University Press, 1986.

Schwartz, Anna J. "Alternative Monetary Regimes: The Gold Standard." In *Alternative Monetary Regimes*, edited by Colin D. Campbell and William R. Dougan, 44-72. Baltimore: Johns Hopkins University Press, 1986.

Shinjo, Hiroshi. *History of the Yen: 100 Years of Japanese Money-Economy*. Kobe: Kobe University, 1962.

Spalding, William F. *Tate's Modern Cambist*. London: Effingham Wilson, 1926.

Spalding, William F. *Dictionary of the World's Currencies and Foreign Exchange*. London: Isaac Pitman, 1928.

Triffin, Robert. *The Evolution of the International Monetary System: Historical Reappraisal and Future Perspectives*. Princeton: International Finance Section, Princeton University, 1964.

Triffin, Robert. *Our International Monetary System: Yesterday, Today, and Tomorrow*. New York:

Random House, 1968.

Wallich, Henry Christopher. *Monetary Problems of an Export Economy: The Cuban Experience, 1914-1947*. Cambridge, MA: Harvard University Press, 1950.

Yeager, Leland B. *International Monetary Relations: Theory, History, and Policy,* second edition. New York: Harper & Row, 1976.

Young, John Parke. *Central American Currency and Finance*. Princeton: Princeton University Press, 1925.

Citation: Officer, Lawrence. "Gold Standard". EH.Net Encyclopedia, edited by Robert Whaples. March 26, 2008. URL http://eh.net/encyclopedia/gold-standard/

Federal Reserve System

Mark Toma, University of Kentucky

The historical origins of the Federal Reserve System can be traced to chronic currency problems in the nineteenth century. Under the National Banking System, national banks were required to hold eligible government securities in order to obtain national bank notes from the Treasury. Contemporary observers complained that such restrictions made the currency inelastic, so that the supply of money did not expand when the demand for money rose, which resulted in periodic shortages of currency and bank panics. In response to the Panic of 1907, Congress created the National Monetary Commission charged with the mission of reforming the currency system. It soon became clear that some type of central banking institution would emerge from the Commissions deliberations, albeit one operating within the context of a gold standard. The key question was what type of central bank? Would it be a centralized one, or a populist, decentralized one?

Early victories went to the advocates of centralization. The head of the National Monetary Commission, Republican Nelson Aldrich, presented a bill to Congress in early 1912 that followed the European model of a monopoly central bank. But Aldrich's bill stalled, and the election of a Democratic President, Woodrow Wilson, in November 1912 gave added momentum to the populist movement. A central bank embodying a decentralized, competitive supply mechanism was now on the fast track.

Over the course of 1913, Wilson and the Democratic Congress crafted the populist blueprint that would become the Federal Reserve Act and would shape the operation of the currency system during the early years (1914-1930) of the Federal Reserve. The nominal structure of the Fed was a curious mixture of private and public elements. On the private side, the Fed was to be polycentric system of 12 reserve banks, each having the power to produce a distinct gold-backed currency marked by a seal indicating the district of origin, each owned by its member banks, and each required to finance itself from earnings. On the public side, the most important government element was the Federal Reserve Board, a political body that was to oversee the operation of the system.

The details of the Federal Reserve Act would determine how the private-public balance would play out. Consider first the financing arrangement. The Act forcefully rejected the typical budgetary arrangement instead giving reserve bank management first call on earnings from discount loans, open market operations, and fees charged for providing clearinghouse services to member banks. These earnings

were to be used to finance reserve bank expenses, dividend payments to member banks, and, residually, payments to the Treasury. One thing the Act did not do was to authorize payments from the general government to the individual reserve banks in case of a shortfall in earnings. In this sense, the reserve banks faced a bottom line.

With respect to ownership rights, the Federal Reserve Act nominally designated member banks as shareholders. They were required to subscribe to the capital stock of their reserve bank. Stock ownership, however, did not convey voting powers. Nor were there secondary markets where shares could be traded.

With respect to selection of the Fed management team, every member of the Federal Reserve Board was to have a government connection. In addition to five political appointees, the Board included the Secretary of Treasury and the Comptroller of Currency. Discount rates set by the individual reserve banks were "subject to review and determination of the Federal Reserve Board." Thus the government, through the Board could influence, if not control, money created through the discount window.

The Federal Reserve Act contained one important loophole, however, which tended to undermine the Board's influence. According to the Act, the one margin of adjustment over which individual reserve banks unambiguously could exercise discretion was the amount of government securities to buy and sell. These open market operations were to be at the initiative of the individual reserve banks and each bank was to have first claim to the earnings generated by the government securities in its portfolio.

Whether the populist founders of the Federal Reserve were fully aware of the role the open market operation loophole might play is subject to debate. Nevertheless, the loophole emerged as a key feature of the money supply process in the first decade, the 1920s, of the system's peacetime operation. While gold convertibility held in check currency oversupply, the power possessed by each reserve bank to purchase government securities for its own account held in check any tendency the Board might have to pursue a tight monetary policy by raising discount rates significantly above market rates.

The Great Depression marked the end to the novel experiment in monetary populism. The Federal Reserve Board sharply raised discount rates and reserve banks failed to fill the void with open market operations. Numerous explanations have been offered for the restrictive depression policy. The traditional explanations have emphasized a failure in leadership, a flawed policy procedure, and a rigid adherence to the gold standard. Another contributing factor may have been a shift in decision-making power away from the individual reserve banks and toward the Board that effectively shutdown the decentralized open market operations that had been the hallmark of the twenties.

In the aftermath of the Great Depression, a series of presidential and legislative initiatives created the Fed we now know. Franklin Roosevelt ended the domestic gold standard in 1934 and the Banking Act of 1935 centralized open market operations under the authority of a new agency, the Federal Open Market Committee, a majority of whose members were political appointees. Interestingly, the new powers lay dormant for the next decade and a half, as the Treasury took the monetary lead. The Treasury-Fed Accord of 1951 ended the period of Treasury dominance and the Fed assumed the role of a full-fledged central bank exercising significant discretionary powers in the last half of the twentieth century.

Recent global events have rekindled mainstream interest in the historical origins of the Fed. For one thing, debate on the institutional structure of the European Monetary Union has invited comparisons with the founding of the Fed. More generally, financial innovations have made it easier for agents worldwide to substitute among various currencies, thereby reducing the power of any single currency

supplier. The upshot is that currency supply in the twenty-first century may have more in common with the "populist" early Fed than the "monopolist" Fed of the late twentieth century.

Further Reading

Broz, J. Lawrence. *The International Origins of the Federal Reserve System*. Ithaca: Cornell University Press, 1997.

Meltzer, Allan H. *A History of the Federal Reserve*, Volume 1, 1913-1951. Chicago: University of Chicago Press, 2003.

Friedman, Milton, and Anna Schwartz. *A Monetary History of the United States, 1867-1960*. Princeton, Princeton University Press, 1963.

Toma, Mark. *Competition and Monopoly in the Federal Reserve System, 1914-1951*. Cambridge: Cambridge University Press, 1997.

Wheelock, David. *The Strategy and Consistency of Federal Reserve Policy, 1924- 1933*. Cambridge: Cambridge University Press, 1991.

Citation: Toma, Mark. "Federal Reserve". EH.Net Encyclopedia, edited by Robert Whaples. June 2, 2004. URL http://eh.net/encyclopedia/federal-reserve-system/

The U.S. Economy in the 1920s

Gene Smiley, Marquette University

Introduction

The interwar period in the United States, and in the rest of the world, is a most interesting era. The decade of the 1930s marks the most severe depression in our history and ushered in sweeping changes in the role of government. Economists and historians have rightly given much attention to that decade. However, with all of this concern about the growing and developing role of government in economic activity in the 1930s, the decade of the 1920s often tends to get overlooked. This is unfortunate because the 1920s are a period of vigorous, vital economic growth. It marks the first truly modern decade and dramatic economic developments are found in those years. There is a rapid adoption of the automobile to the detriment of passenger rail travel. Though suburbs had been growing since the late nineteenth century their growth had been tied to rail or trolley access and this was limited to the largest cities. The flexibility of car access changed this and the growth of suburbs began to accelerate. The demands of trucks and cars led to a rapid growth in the construction of all-weather surfaced roads to facilitate their movement. The rapidly expanding electric utility networks led to new consumer appliances and new types of lighting and heating for homes and businesses. The introduction of the radio, radio stations, and commercial radio networks began to break up rural isolation, as did the expansion of local and long-distance telephone communications. Recreational activities such as traveling, going to movies, and professional sports became major businesses. The period saw major innovations in business organization and manufacturing technology. The Federal Reserve System first tested its powers and the United States moved to a dominant position in international trade and global business. These things

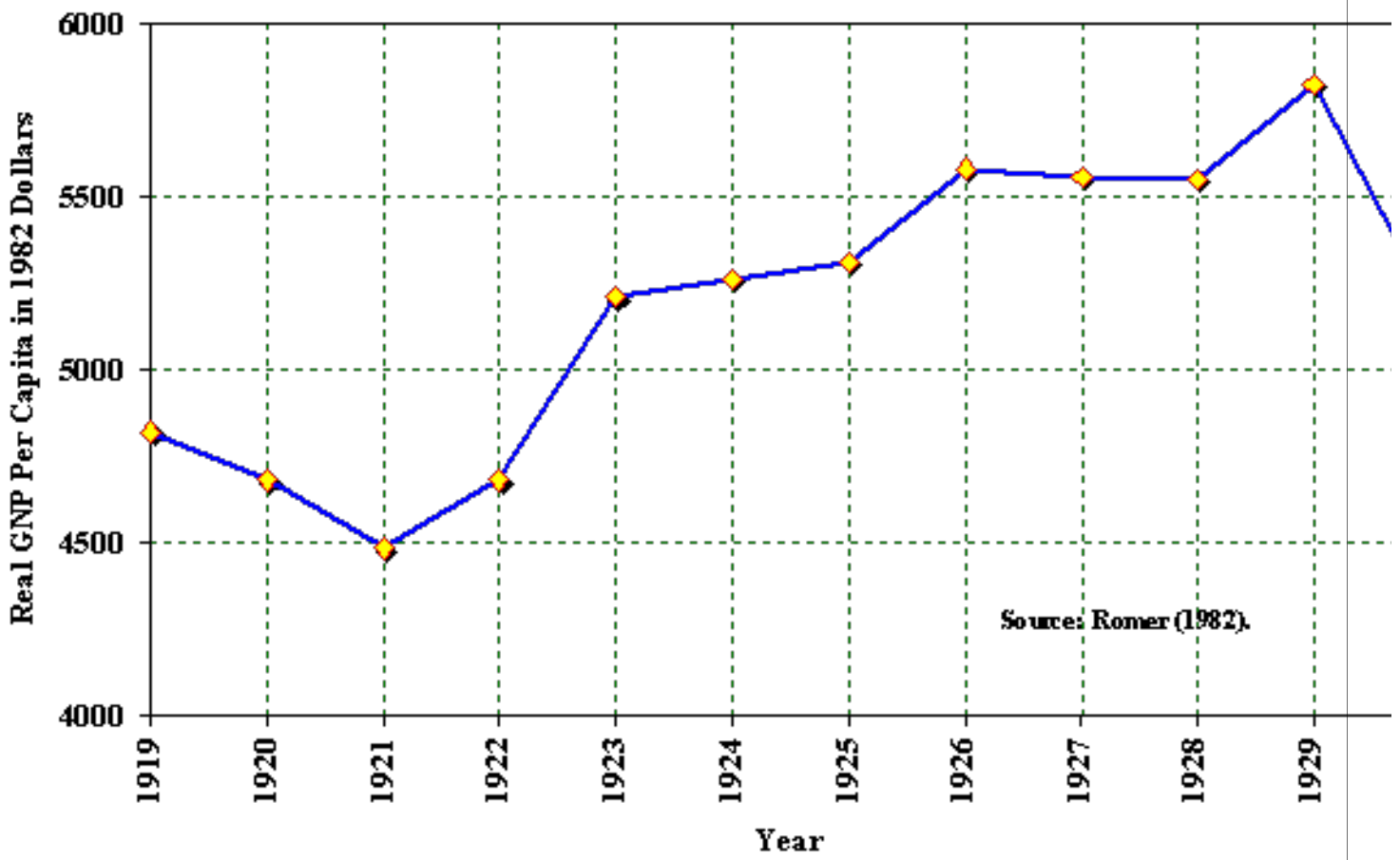
make the 1920s a period of considerable importance independent of what happened in the 1930s.

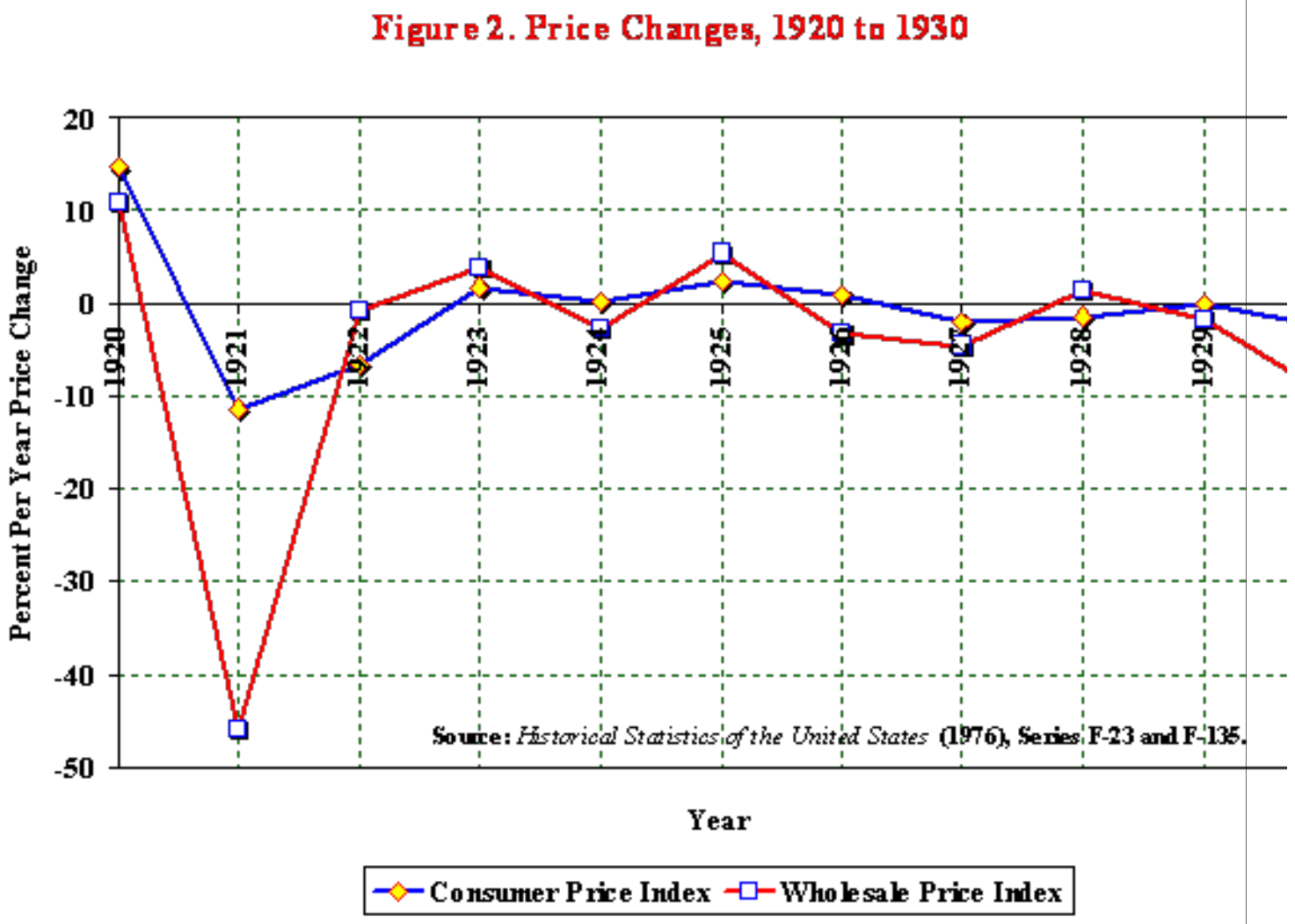
National Product and Income and Prices

We begin the survey of the 1920s with an examination of the overall production in the economy, GNP, the most comprehensive measure of aggregate economic activity. Real GNP growth during the 1920s was relatively rapid, 4.2 percent a year from 1920 to 1929 according to the most widely used estimates. (Historical Statistics of the United States, or HSUS, 1976) Real GNP per capita grew 2.7 percent per year between 1920 and 1929. By both nineteenth and twentieth century standards these were relatively rapid rates of real economic growth and they would be considered rapid even today.

There were several interruptions to this growth. In mid-1920 the American economy began to contract and the 1920-1921 depression lasted about a year, but a rapid recovery reestablished full-employment by 1923. As will be discussed below, the Federal Reserve System's monetary policy was a major factor in initiating the 1920-1921 depression. From 1923 through 1929 growth was much smoother. There was a very mild recession in 1924 and another mild recession in 1927 both of which may be related to oil price shocks (McMillin and Parker, 1994). The 1927 recession was also associated with Henry Ford's shut-down of all his factories for six months in order to changeover from the Model T to the new Model A automobile. Though the Model T's market share was declining after 1924, in 1926 Ford's Model T still made up nearly 40 percent of all the new cars produced and sold in the United States. The Great Depression began in the summer of 1929, possibly as early as June. The initial downturn was relatively mild but the contraction accelerated after the crash of the stock market at the end of October. Real total GNP fell 10.2 percent from 1929 to 1930 while real GNP per capita fell 11.5 percent from 1929 to 1930.

Figure 1: Real GNP Per Capita, 1919-1930





Price changes during the 1920s are shown in Figure 2. The Consumer Price Index, CPI, is a better measure of changes in the prices of commodities and services that a typical consumer would purchase, while the Wholesale Price Index, WPI, is a better measure in the changes in the cost of inputs for businesses. As the figure shows the 1920-1921 depression was marked by extraordinarily large price decreases. Consumer prices fell 11.3 percent from 1920 to 1921 and fell another 6.6 percent from 1921 to 1922. After that consumer prices were relatively constant and actually fell slightly from 1926 to 1927 and from 1927 to 1928. Wholesale prices show greater variation. The 1920-1921 depression hit farmers very hard. Prices had been bid up with the increasing foreign demand during the First World War. As European production began to recover after the war prices began to fall. Though the prices of agricultural products fell from 1919 to 1920, the depression brought on dramatic declines in the prices of raw agricultural produce as well as many other inputs that firms employ. In the scramble to beat price increases during 1919 firms had built up large inventories of raw materials and purchased inputs and this temporary increase in demand led to even larger price increases. With the depression firms began to draw down those inventories. The result was that the prices of raw materials and manufactured inputs fell rapidly along with the prices of agricultural produce—the WPI dropped 45.9 percent between 1920 and 1921. The price changes probably tend to overstate the severity of the 1920-1921 depression. Romer's recent work (1988) suggests that prices changed much more easily in that depression reducing the drop in production and employment. Wholesale prices in the rest of the 1920s were relatively stable though they were more likely to fall than to rise.

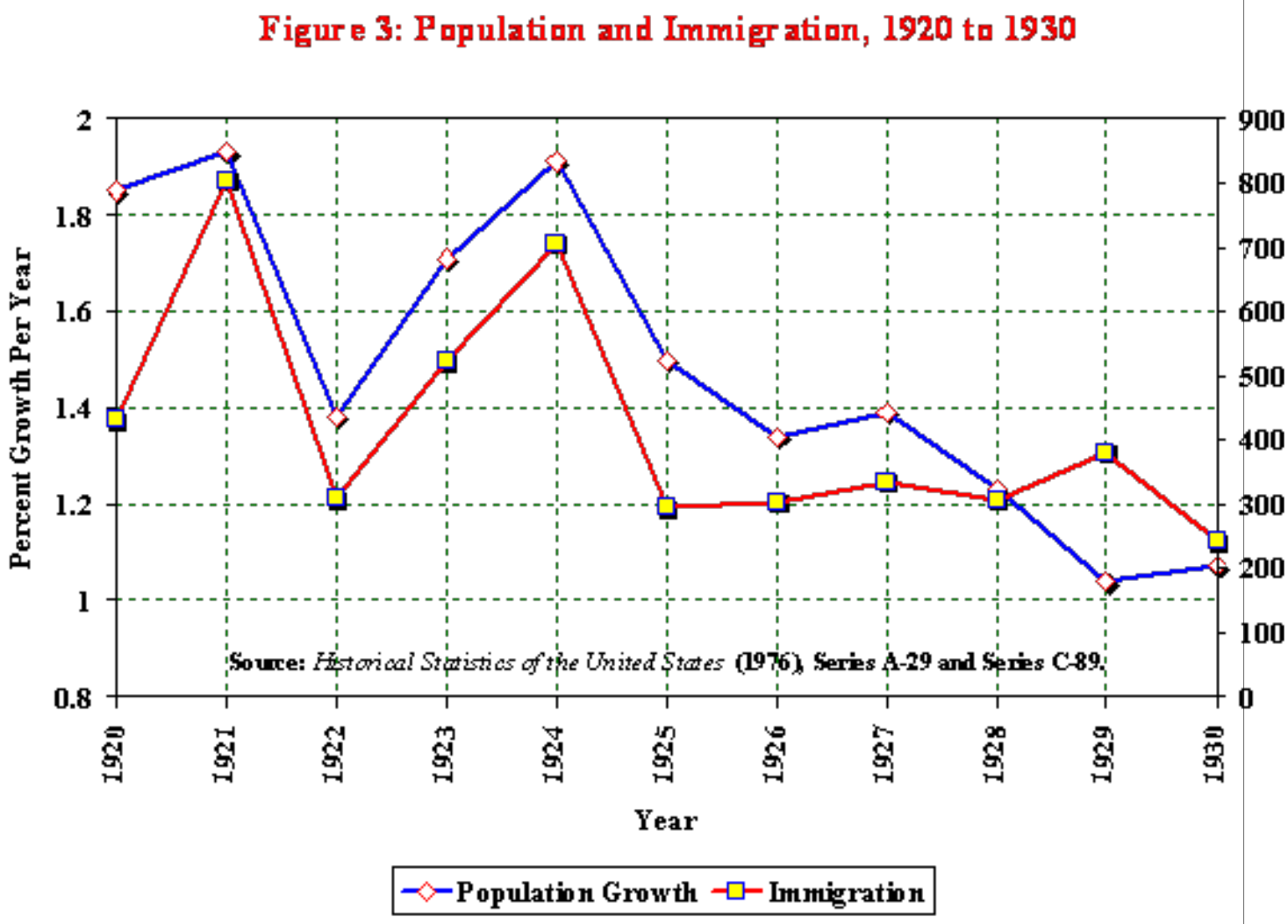
Economic Growth in the 1920s

Despite the 1920-1921 depression and the minor interruptions in 1924 and 1927, the American economy

exhibited impressive economic growth during the 1920s. Though some commentators in later years thought that the existence of some slow growing or declining sectors in the twenties suggested weaknesses that might have helped bring on the Great Depression, few now argue this. Economic growth never occurs in all sectors at the same time and at the same rate. Growth reallocates resources from declining or slower growing sectors to the more rapidly expanding sectors in accordance with new technologies, new products and services, and changing consumer tastes.

Economic growth in the 1920s was impressive. Ownership of cars, new household appliances, and housing was spread widely through the population. New products and processes of producing those products drove this growth. The combination of the widening use of electricity in production and the growing adoption of the moving assembly line in manufacturing combined to bring on a continuing rise in the productivity of labor and capital. Though the average workweek in most manufacturing remained essentially constant throughout the 1920s, in a few industries, such as railroads and coal production, it declined. (Whaples 2001) New products and services created new markets such as the markets for radios, electric iceboxes, electric irons, fans, electric lighting, vacuum cleaners, and other laborsaving household appliances. This electricity was distributed by the growing electric utilities. The stocks of those companies helped create the stock market boom of the late twenties. RCA, one of the glamour stocks of the era, paid no dividends but its value appreciated because of expectations for the new company. Like the Internet boom of the late 1990s, the electricity boom of the 1920s fed a rapid expansion in the stock market.

Fed by continuing productivity advances and new products and services and facilitated by an environment of stable prices that encouraged production and risk taking, the American economy embarked on a sustained expansion in the 1920s.



Population and Labor in the 1920s

At the same time that overall production was growing, population growth was declining. As can be seen in Figure 3, from an annual rate of increase of 1.85 and 1.93 percent in 1920 and 1921, respectively, population growth rates fell to 1.23 percent in 1928 and 1.04 percent in 1929.

These changes in the overall growth rate were linked to the birth and death rates of the resident population and a decrease in foreign immigration. Though the crude death rate changed little during the period, the crude birth rate fell sharply into the early 1930s. (Figure 4) There are several explanations for the decline in the birth rate during this period. First, there was an accelerated rural-to-urban migration. Urban families have tended to have fewer children than rural families because urban children do not augment family incomes through their work as unpaid workers as rural children do. Second, the period also saw continued improvement in women's job opportunities and a rise in their labor force participation rates.

Immigration also fell sharply. In 1917 the federal government began to limit immigration and in 1921 an immigration act limited the number of prospective citizens of any nationality entering the United States each year to no more than 3 percent of that nationality's resident population

Figure 4: Crude Birth and Death Rates, 1920 to 1930

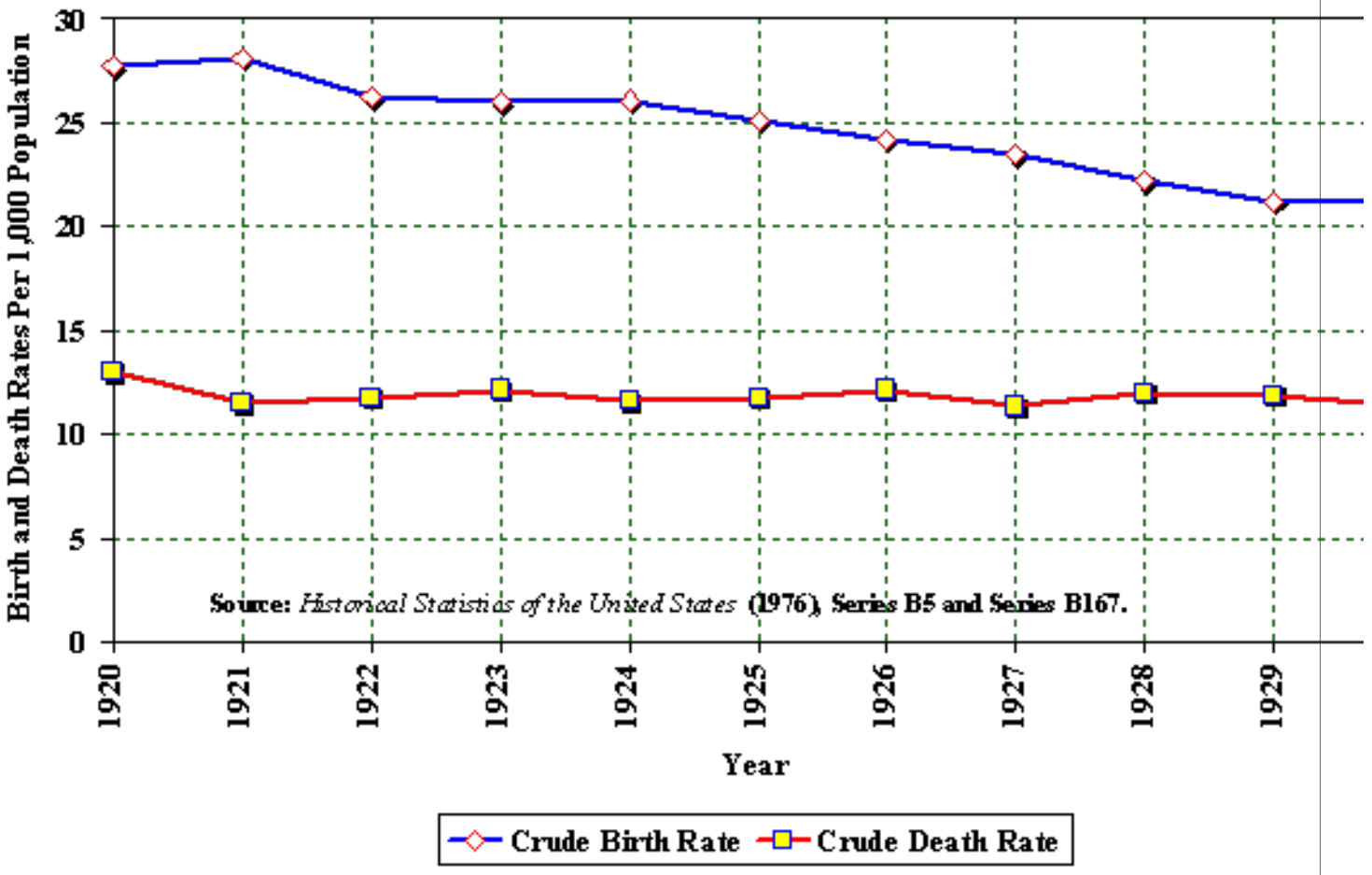
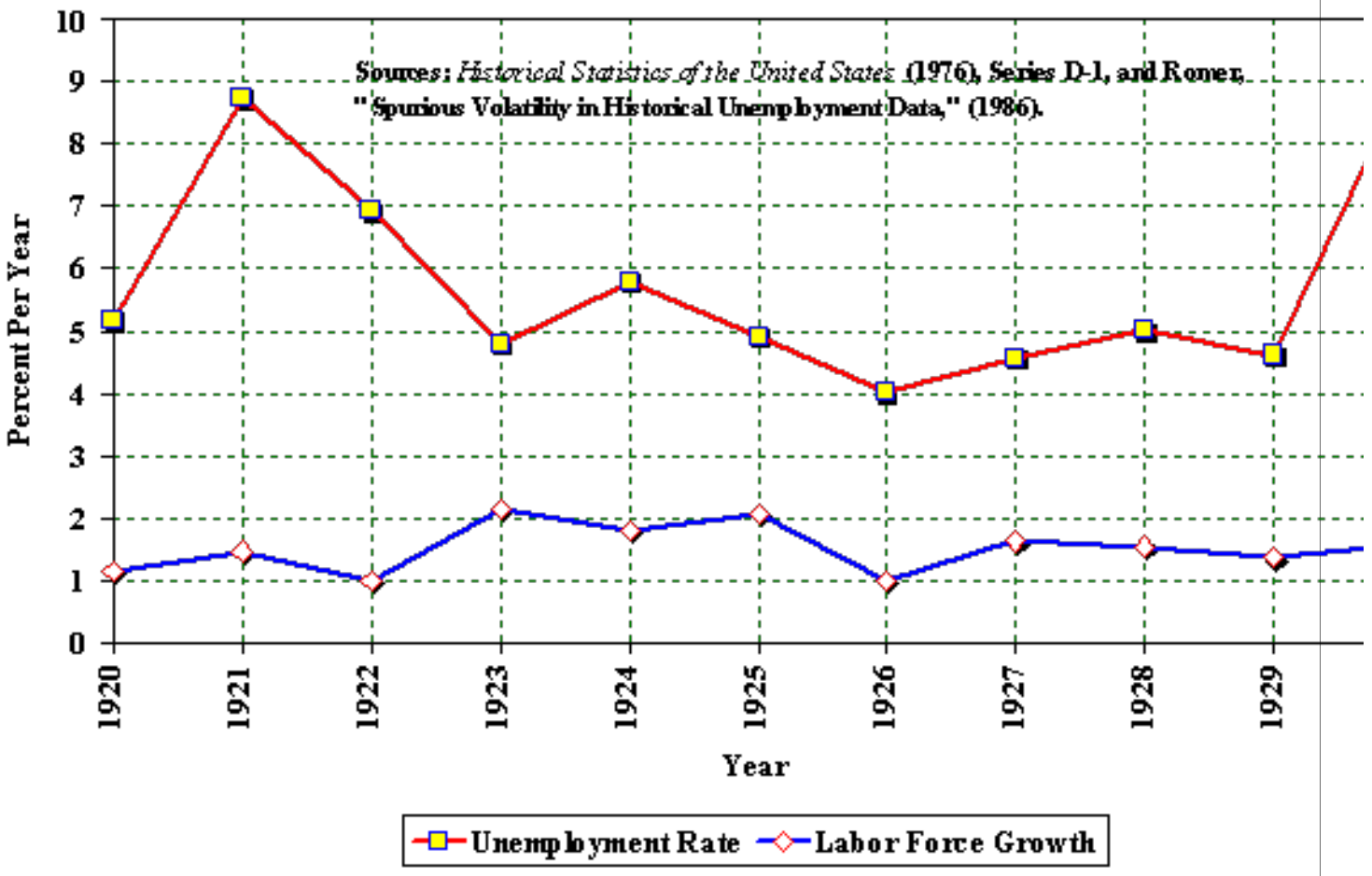


Figure 5: Labor Force Growth and Unemployment, 1920 to 1930



as of the 1910 census. A new act in 1924 lowered this to 2 percent of the resident population at the 1890 census and more firmly blocked entry for people from central, southern, and eastern European nations. The limits were relaxed slightly in 1929.

The American population also continued to move during the interwar period. Two regions experienced the largest losses in population shares, New England and the Plains. For New England this was a continuation of a long-term trend. The population share for the Plains region had been rising through the nineteenth century. In the interwar period its agricultural base, combined with the continuing shift from agriculture to industry, led to a sharp decline in its share. The regions gaining population were the Southwest and, particularly, the far West.— California began its rapid growth at this time.

Table 1: Real Average Weekly or Daily Earnings for Selected Occupations, 1920 to 1930. (1929=100)

Year	(1) Weekly: Skilled and Semi-Skilled Male Production Workers Workers in 25 Manufacturing Industries	(2) Weekly: Unskilled Male Production Workers Workers in 25 Manufacturing Industries	(3) Weekly: Female Production Workers Workers in 25 Manufacturing Industries	(4) Weekly: Bituminous Coal-Lignite Mining	(5) Farmwo Daily W Rat
1920	29.16	22.28	15.14	--	2.8
1921	26.19	19.41	14.96	--	1.9
1922	28.73	20.74	16.19	--	2.0
1923	30.93	22.37	17.31	25.51	2.1
1924	30.61	22.45	16.78	23.47	2.4
1925	30.57	22.41	16.78	25.64	2.1
1926	30.60	22.47	16.72	27.51	2.1
1927	31.09	23.22	17.14	23.85	2.1
1928	31.94	23.89	17.15	24.46	2.1
1929	32.60	24.40	17.61	25.11	2.1
1930	29.93	22.47	16.40	22.61	2.2

Source: U.S. Department of Commerce, Bureau of the Census, *Historical Statistics of the United States: Colonial Times to 1970* (Washington, DC: USGPO, 1976). Col. (1): Series D844. Col. (2): Series D841. Co (3): Series D838. Col. (4): Series D811. Col. (5): Series K181. All dollar figures were deflated by the Cons Price Index from series E135 set to 1929=100.

During the 1920s the labor force grew at a more rapid rate than population. This somewhat more rapid growth came from the declining share of the population less than 14 years old and therefore not in the labor force. In contrast, the labor force participation rates, or fraction of the population aged 14 and over that was in the labor force, declined during the twenties from 57.7 percent to 56.3 percent. This was entirely due to a fall in the male labor force participation rate from 89.6 percent to 86.8 percent as the female labor force participation rate rose from 24.3 percent to 25.1 percent. The primary source of the fall in male labor force participation rates was a rising retirement rate. Employment rates for males who were 65 or older fell from 60.1 percent in 1920 to 58.0 percent in 1930.

With the depression of 1920-1921 the unemployment rate rose rapidly from 5.2 to 8.7 percent. The recovery reduced unemployment to an average rate of 4.8 percent in 1923. The unemployment rate rose to 5.8 percent in the recession of 1924 and to 5.0 percent with the slowdown in 1927. Otherwise unemployment remained relatively low. The onset of the Great Depression from the summer of 1929 on brought the unemployment rate from 4.6 percent in 1929 to 8.9 percent in 1930. (Figure 5)

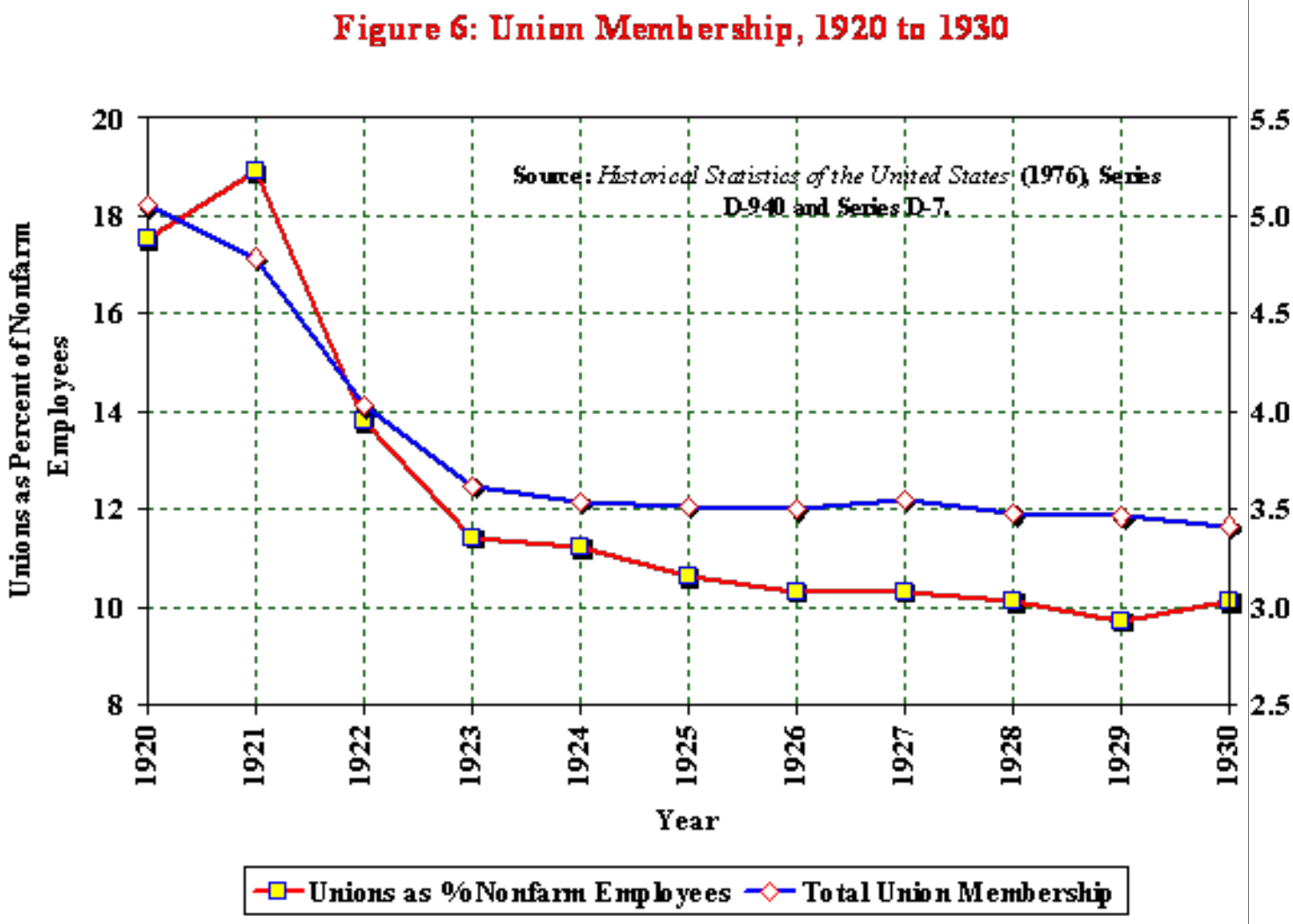
Earnings for laborers varied during the twenties. Table 1 presents average weekly earnings for 25 manufacturing industries. For these industries male skilled and semi-skilled laborers generally commanded a premium of 35 percent over the earnings of unskilled male laborers in the twenties. Unskilled males received on average 35 percent more than females during the twenties. Real average weekly earnings for these 25 manufacturing industries rose somewhat during the 1920s. For skilled and semi-skilled male workers real average weekly earnings rose 5.3 percent between 1923 and 1929, while real average weekly earnings for unskilled males rose 8.7 percent between 1923 and 1929. Real average weekly earnings for females rose on 1.7 percent between 1923 and 1929. Real weekly earnings for bituminous and lignite coal miners fell as the coal industry encountered difficult times in the late twenties and the real daily wage rate for farmworkers in the twenties, reflecting the ongoing difficulties in agriculture, fell after the recovery from the 1920-1921 depression.

The 1920s were not kind to labor unions even though the First World War had solidified the dominance of the American Federation of Labor among labor unions in the United States. The rapid growth in union membership fostered by federal government policies during the war ended in 1919. A committee of AFL craft unions undertook a successful membership drive in the steel industry in that year. When U.S. Steel refused to bargain, the committee called a strike, the failure of which was a sharp blow to the unionization drive. (Brody, 1965) In the same year, the United Mine Workers undertook a large strike and also lost. These two lost strikes and the 1920-21 depression took the impetus out of the union movement and led to severe membership losses that continued through the twenties. (Figure 6)

Under Samuel Gompers's leadership, the AFL's "business unionism" had attempted to promote the union and collective bargaining as the primary answer to the workers' concerns with wages, hours, and working conditions. The AFL officially opposed any government actions that would have diminished worker attachment to unions by providing competing benefits, such as government sponsored unemployment insurance, minimum wage proposals, maximum hours proposals and social security programs. As Lloyd Ulman (1961) points out, the AFL, under Gompers' direction, differentiated on the basis of whether the statute would or would not aid collective bargaining. After Gompers' death, William Green led the AFL in a policy change as the AFL promoted the idea of union-management cooperation to improve output and promote greater employer acceptance of unions. But Irving Bernstein (1965) concludes that, on the whole, union-management cooperation in the twenties was a failure.

To combat the appeal of unions in the twenties, firms used the "yellow-dog" contract requiring employees to swear they were not union members and would not join one; the "American Plan" promoting the open shop and contending that the closed shop was un-American; and welfare capitalism. The most common aspects of welfare capitalism included personnel management to handle employment issues and problems, the doctrine of "high wages," company group life insurance, old-age pension plans, stock-purchase plans, and more. Some firms formed company unions to thwart independent unionization and the number of company-controlled unions grew from 145 to 432 between 1919 and 1926.

Until the late thirties the AFL was a voluntary association of independent national craft unions. Craft unions relied upon the particular skills the workers had acquired (their craft) to distinguish the workers and provide barriers to the entry of other workers. Most craft unions required a period of apprenticeship before a worker was fully accepted as a journeyman worker. The skills, and often lengthy apprenticeship, constituted the entry barrier that gave the union its bargaining



power. There were only a few unions that were closer to today's industrial unions where the required skills were much less (or nonexistent) making the entry of new workers much easier. The most important of these industrial unions was the United Mine Workers, UMW.

The AFL had been created on two principles: the autonomy of the national unions and the exclusive jurisdiction of the national union.—Individual union members were not, in fact, members of the AFL; rather, they were members of the local and national union, and the national was a member of the AFL. Representation in the AFL gave dominance to the national unions, and, as a result, the AFL had little effective power over them. The craft lines, however, had never been distinct and increasingly became blurred. The AFL was constantly mediating jurisdictional disputes between member national unions. Because the AFL and its individual unions were not set up to appeal to and work for the relatively less skilled industrial workers, union organizing and growth lagged in the twenties.

Agriculture

The onset of the First World War in Europe brought unprecedented prosperity to American farmers. As agricultural production in Europe declined, the demand for American agricultural exports rose, leading to rising farm product prices and incomes. In response to this, American farmers expanded production by moving onto marginal farmland, such as Wisconsin cutover property on the edge of the woods and hilly terrain in the Ozark and Appalachian regions. They also increased output by purchasing more machinery, such as tractors, plows, mowers, and threshers. The price of farmland, particularly marginal farmland, rose in response to the increased demand, and the debt of American farmers increased substantially.

Figure 7: Real Average Income Per Farm, 1920 to 1930

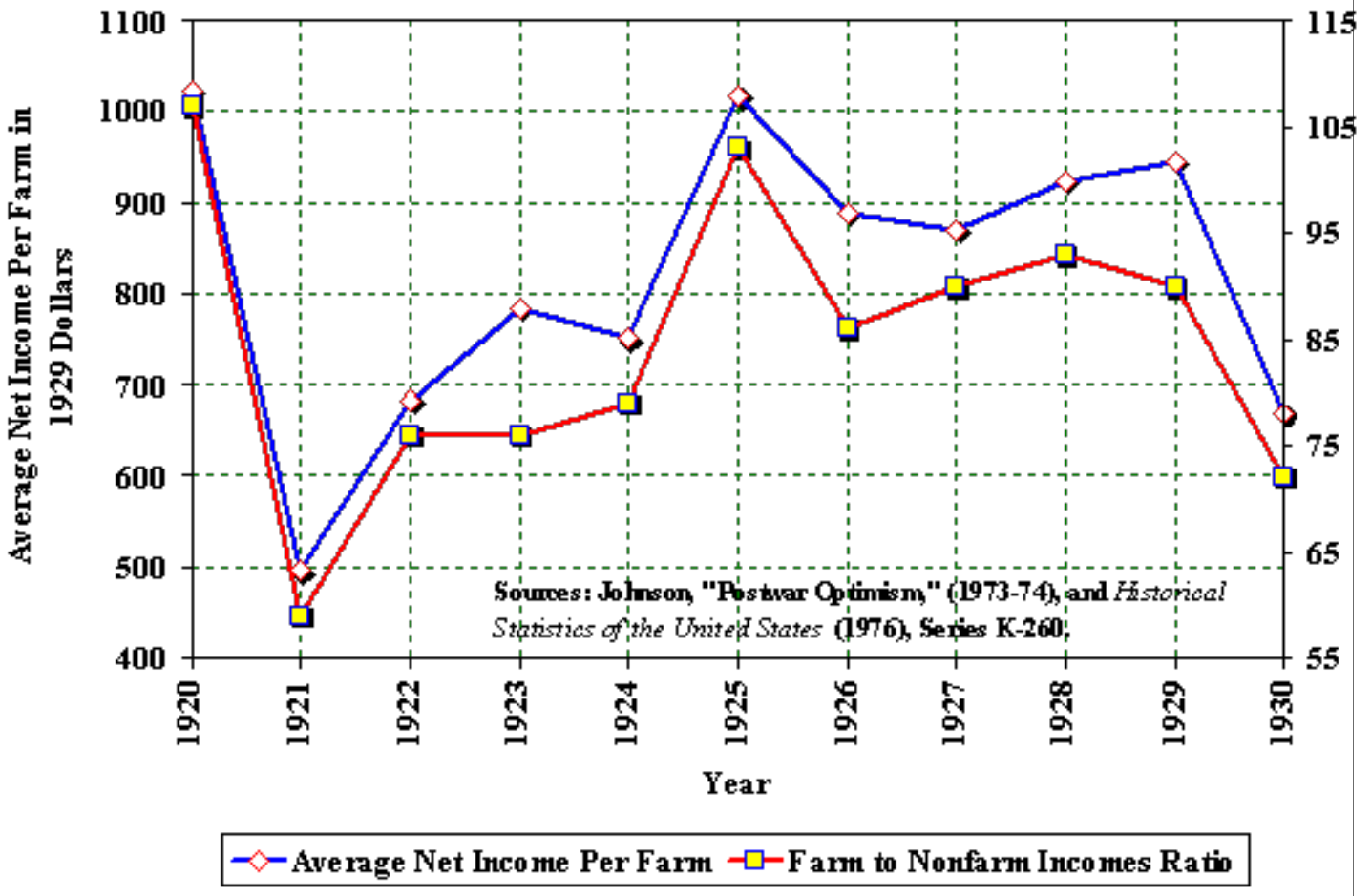
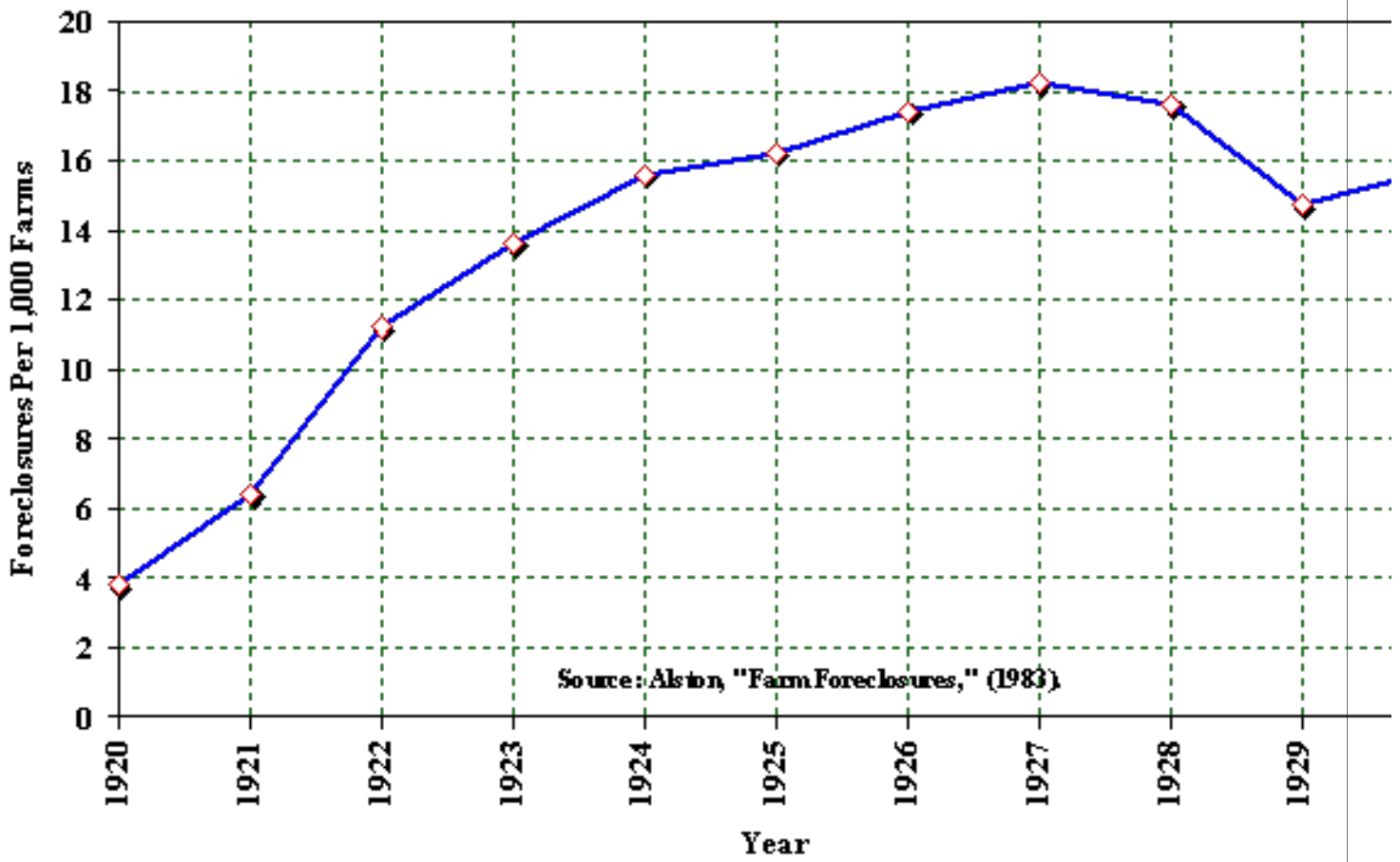


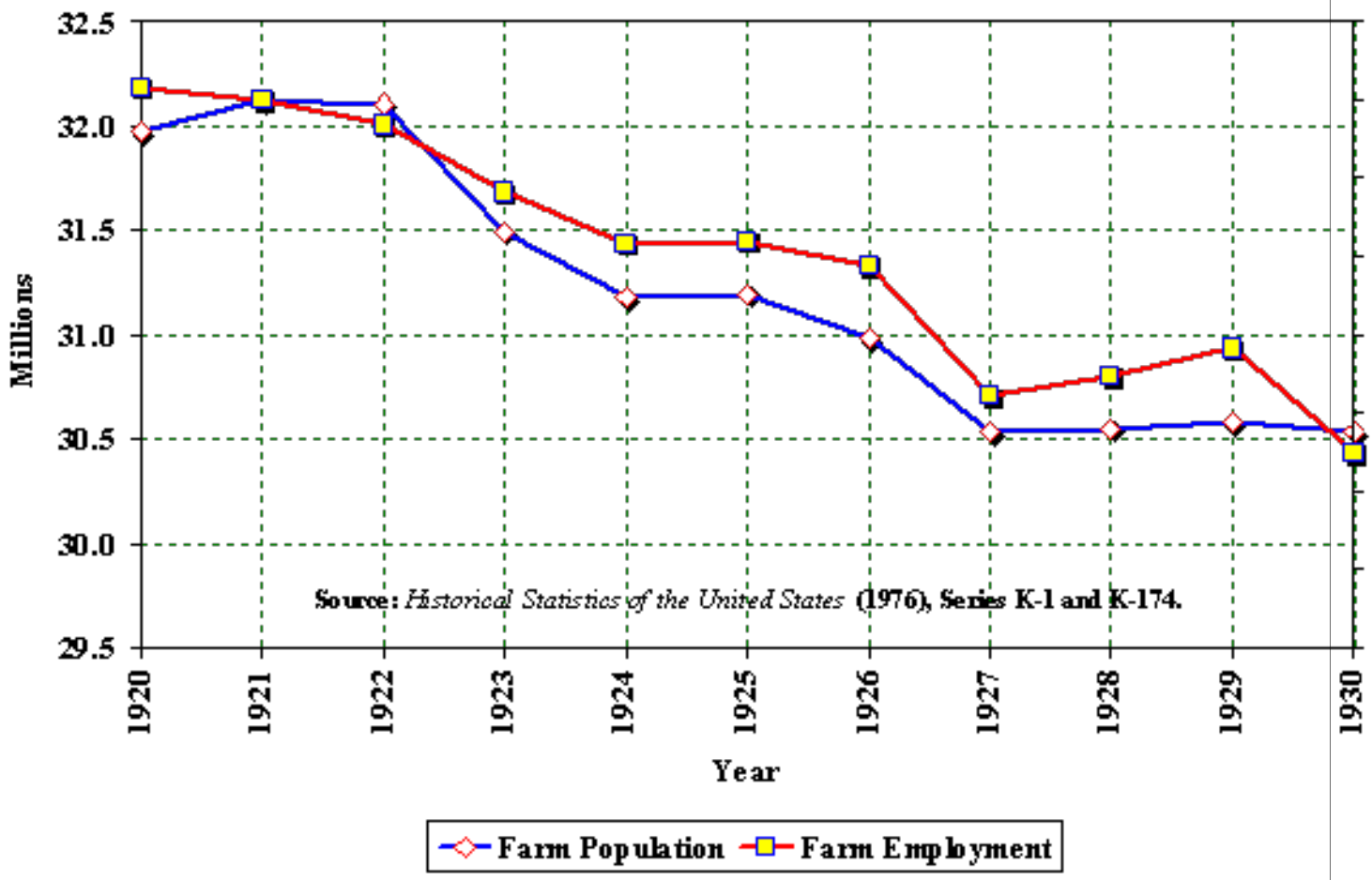
Figure 8: Farm Mortgage Foreclosure Rate, 1920 to 1930



This expansion of American agriculture continued past the end of the First World War as farm exports to Europe and farm prices initially remained high. However, agricultural production in Europe recovered much faster than most observers had anticipated. Even before the onset of the short depression in 1920, farm exports and farm product prices had begun to fall. During the depression, farm prices virtually collapsed. From 1920 to 1921, the consumer price index fell 11.3 percent, the wholesale price index fell 45.9 percent, and the farm products price index fell 53.3 percent. (HSUS, Series E40, E42, and E135)

Real average net income per farm fell over 72.6 percent between 1920 and 1921 and, though rising in the twenties, never recovered the relative levels of 1918 and 1919. (Figure 7) Farm mortgage foreclosures rose and stayed at historically high levels for the entire decade of the 1920s. (Figure 8) The value of farmland and buildings fell throughout the twenties and, for the first time in American history, the number of cultivated acres actually declined as farmers pulled back from the marginal farmland brought into production during the war. Rather than indicators of a general depression in agriculture in the twenties, these were the results of the financial commitments made by overoptimistic American farmers during and directly after the war. The foreclosures were generally on second mortgages rather than on first mortgages as they were in the early 1930s. (Johnson, 1973; Alston, 1983)

Figure 9: Farm Population and Employment



A Declining Sector

A major difficulty in analyzing the interwar agricultural sector lies in separating the effects of the 1920-21 and 1929-33 depressions from those that arose because agriculture was declining relative to the other sectors. A relatively very slow growing demand for basic agricultural products and significant increases in the productivity of labor, land, and machinery in agricultural production combined with a much more rapid extensive economic growth in the nonagricultural sectors of the economy required a shift of

resources, particularly labor, out of agriculture. (Figure 9) The market induces labor to voluntarily move from one sector to another through income differentials, suggesting that even in the absence of the effects of the depressions, farm incomes would have been lower than nonfarm incomes so as to bring about this migration.

The continuous substitution of tractor power for horse and mule power released hay and oats acreage to grow crops for human consumption. Though cotton and tobacco continued as the primary crops in the south, the relative production of cotton continued to shift to the west as production in Arkansas, Missouri, Oklahoma, Texas, New Mexico, Arizona, and California increased. As quotas reduced immigration and incomes rose, the demand for cereal grains grew slowly—more slowly than the supply—and the demand for fruits, vegetables, and dairy products grew. Refrigeration and faster freight shipments expanded the milk sheds further from metropolitan areas. Wisconsin and other North Central states began to ship cream and cheeses to the Atlantic Coast. Due to transportation improvements, specialized truck farms and the citrus industry became more important in California and Florida. (Parker, 1972; Soule, 1947)

The relative decline of the agricultural sector in this period was closely related to the highly inelastic income elasticity of demand for many farm products, particularly cereal grains, pork, and cotton. As incomes grew, the demand for these staples grew much more slowly. At the same time, rising land and labor productivity were increasing the supplies of staples, causing real prices to fall.

Table 3 presents selected agricultural productivity statistics for these years. Those data indicate that there were greater gains in labor productivity than in land productivity (or per acre yields). Per acre yields in wheat and hay actually decreased between 1915-19 and 1935-39. These productivity increases, which released resources from the agricultural sector, were the result of technological improvements in agriculture.

TABLE 2:
SELECTED AGRICULTURAL PRODUCTIVITY STATISTICS, 1915-1929.
(Annual Averages)

	Labor-Hours Per Unit							Per Acre Yields		
	Wheat	Corn	Cotton	Hay	Milk	Beef	Hogs	Wheat	Corn	Cotton
Period	100 Bush.)	100 (Bush)	(Bales)	(Tons)	(Cwt)	(Cwt)	(Cwt)	(Bush.)	(Bush.)	(Lbs.)
1915-19	98	132	299	10.4	3.7	4.5	3.6	13.9	25.9	168
1920-24	90	122	296	10.2	3.6	4.5	3.5	13.8	26.8	155
1925-29	74	115	268	9.8	3.3	4.3	3.3	14.1	26.3	171

Source: *Historical Statistics of the United States: Colonial Times to 1970* (Washington: U.S. Government Printing O 1976).

Technological Improvements In Agricultural Production

In many ways the adoption of the tractor in the interwar period symbolizes the technological changes that occurred in the agricultural sector. This changeover in the power source that farmers used had far-reaching consequences and altered the organization of the farm and the farmers' lifestyle. The adoption of the tractor was land saving (by releasing acreage previously used to produce crops for workstock) and labor saving. At the same time it increased the risks of farming because farmers were now much more exposed to the marketplace. They could not produce their own fuel for tractors as they had for the

workstock. Rather, this had to be purchased from other suppliers. Repair and replacement parts also had to be purchased, and sometimes the repairs had to be undertaken by specialized mechanics. The purchase of a tractor also commonly required the purchase of new complementary machines; therefore, the decision to purchase a tractor was not an isolated one. (White, 2001; Ankli, 1980; Ankli and Olmstead, 1981; Musoke, 1981; Whatley, 1987). These changes resulted in more and more farmers purchasing and using tractors, but the rate of adoption varied sharply across the United States.

Technological innovations in plants and animals also raised productivity. Hybrid seed corn increased yields from an average of 40 bushels per acre to 100 to 120 bushels per acre. New varieties of wheat were developed from the hardy Russian and Turkish wheat varieties which had been imported. The U.S. Department of Agriculture's Experiment Stations took the lead in developing wheat varieties for different regions. For example, in the Columbia River Basin new varieties raised yields from an average of 19.1 bushels per acre in 1913-22 to 23.1 bushels per acre in 1933-42. (Shepherd, 1980) New hog breeds produced more meat and new methods of swine sanitation sharply increased the survival rate of piglets. An effective serum for hog cholera was developed, and the federal government led the way in the testing and eradication of bovine tuberculosis and brucellosis. Prior to the Second World War, a number of pesticides to control animal disease were developed, including cattle dips and disinfectants. By the mid-1920s a vaccine for "blackleg," an infectious, usually fatal disease that particularly struck young cattle, was completed. The cattle tick, which carried Texas Fever, was largely controlled through inspections. (Schlebecker, 1975; Bogue, 1983; Wood, 1980)

Federal Agricultural Programs in the 1920s

Though there was substantial agricultural discontent in the period from the Civil War to late 1890s, the period from then to the onset of the First World War was relatively free from overt farmers' complaints. In later years farmers dubbed the 1910-14 period as agriculture's "golden years" and used the prices of farm crops and farm inputs in that period as a standard by which to judge crop and input prices in later years. The problems that arose in the agricultural sector during the twenties once again led to insistent demands by farmers for government to alleviate their distress.

Though there were increasing calls for direct federal government intervention to limit production and raise farm prices, this was not used until Roosevelt took office. Rather, there was a reliance upon the traditional method to aid injured groups—tariffs, and upon the "sanctioning and promotion of cooperative marketing associations." In 1921 Congress attempted to control the grain exchanges and compel merchants and stockyards to charge "reasonable rates," with the Packers and Stockyards Act and the Grain Futures Act. In 1922 Congress passed the Capper-Volstead Act to promote agricultural cooperatives and the Fordney-McCumber Tariff to impose high duties on most agricultural imports.—The Cooperative Marketing Act of 1924 did not bolster failing cooperatives as it was supposed to do. (Hoffman and Liebcap, 1991)

Twice between 1924 and 1928 Congress passed "McNary-Haugan" bills, but President Calvin Coolidge vetoed both. The McNary-Haugan bills proposed to establish "fair" exchange values (based on the 1910-14 period) for each product and to maintain them through tariffs and a private corporation that would be chartered by the government and could buy enough of each commodity to keep its price up to the computed fair level. The revenues were to come from taxes imposed on farmers. The Hoover administration passed the Hawley-Smoot tariff in 1930 and an Agricultural Marketing Act in 1929. This act committed the federal government to a policy of stabilizing farm prices through several nongovernment institutions but these failed during the depression. Federal intervention in the

agricultural sector really came of age during the New Deal era of the 1930s.

Manufacturing

Agriculture was not the only sector experiencing difficulties in the twenties. Other industries, such as textiles, boots and shoes, and coal mining, also experienced trying times. However, at the same time that these industries were declining, other industries, such as electrical appliances, automobiles, and construction, were growing rapidly. The simultaneous existence of growing and declining industries has been common to all eras because economic growth and technological progress never affect all sectors in the same way. In general, in manufacturing there was a rapid rate of growth of productivity during the twenties. The rise of real wages due to immigration restrictions and the slower growth of the resident population spurred this. Transportation improvements and communications advances were also responsible. These developments brought about differential growth in the various manufacturing sectors in the United States in the 1920s.

Because of the historic pattern of economic development in the United States, the northeast was the first area to really develop a manufacturing base. By the mid-nineteenth century the East North Central region was creating a manufacturing base and the other regions began to create manufacturing bases in the last half of the nineteenth century resulting in a relative westward and southern shift of manufacturing activity. This trend continued in the 1920s as the New England and Middle Atlantic regions' shares of manufacturing employment fell while all of the other regions—excluding the West North Central region—gained. There was considerable variation in the growth of the industries and shifts in their ranking during the decade. The largest broadly defined industries were, not surprisingly, food and kindred products; textile mill products; those producing and fabricating primary metals; machinery production; and chemicals. When industries are more narrowly defined, the automobile industry, which ranked third in manufacturing value added in 1919, ranked first by the mid-1920s.

Productivity Developments

Gavin Wright (1990) has argued that one of the underappreciated characteristics of American industrial history has been its reliance on mineral resources. Wright argues that the growing American strength in industrial exports and industrialization in general relied on an increasing intensity in nonreproducible natural resources. The large American market was knit together as one large market without internal barriers through the development of widespread low-cost transportation. Many distinctively American developments, such as continuous-process, mass-production methods were associated with the "high throughput" of fuel and raw materials relative to labor and capital inputs. As a result the United States became the dominant industrial force in the world 1920s and 1930s. According to Wright, after World War II "the process by which the United States became a unified 'economy' in the nineteenth century has been extended to the world as a whole. To a degree, natural resources have become commodities rather than part of the 'factor endowment' of individual countries." (Wright, 1990)

In addition to this growing intensity in the use of nonreproducible natural resources as a source of productivity gains in American manufacturing, other technological changes during the twenties and thirties tended to raise the productivity of the existing capital through the replacement of critical types of capital equipment with superior equipment and through changes in management methods. (Soule, 1947; Lorant, 1967; Devine, 1983; Oshima, 1984) Some changes, such as the standardization of parts and processes and the reduction of the number of styles and designs, raised the productivity of both capital and labor. Modern management techniques, first introduced by Frederick W. Taylor, were introduced

on a wider scale.

One of the important forces contributing to mass production and increased productivity was the transfer to electric power. (Devine, 1983) By 1929 about 70 percent of manufacturing activity relied on electricity, compared to roughly 30 percent in 1914. Steam provided 80 percent of the mechanical drive capacity in manufacturing in 1900, but electricity provided over 50 percent by 1920 and 78 percent by 1929. An increasing number of factories were buying their power from electric utilities. In 1909, 64 percent of the electric motor capacity in manufacturing establishments used electricity generated on the factory site; by 1919, 57 percent of the electricity used in manufacturing was purchased from independent electric utilities.

The shift from coal to oil and natural gas and from raw unprocessed energy in the forms of coal and waterpower to processed energy in the form of internal combustion fuel and electricity increased thermal efficiency. After the First World War energy consumption relative to GNP fell, there was a sharp increase in the growth rate of output per labor-hour, and the output per unit of capital input once again began rising. These trends can be seen in the data in Table 3. Labor productivity grew much more rapidly during the 1920s than in the previous or following decade. Capital productivity had declined in the decade previous to the 1920s while it also increased sharply during the twenties and continued to rise in the following decade. Alexander Field (2003) has argued that the 1930s were the most technologically progressive decade of the twentieth century basing his argument on the growth of multi-factor productivity as well as the impressive array of technological developments during the thirties. However, the twenties also saw impressive increases in labor and capital productivity as, particularly, developments in energy and transportation accelerated.

Table 3: Average Annual Rates of Labor Productivity and Capital Productivity Growth.

Period	Average Annual Labor Productivity Growth	Average Annual Capital Productivity Growth
1899-1909	1.30%	-1.62%
1909-1919	1.14	-1.95
1919-1929	5.44	4.21
1929-1937	1.95	2.38

Source: Devine (1983), Table 2. The average annual percentage rates of growth are calculated as instantaneous rates of change.

Warren Devine, Jr. (1983) reports that in the twenties the most important result of the adoption of electricity was that it would be an indirect “lever to increase production.” There were a number of ways in which this occurred. Electricity brought about an increased flow of production by allowing new flexibility in the design of buildings and the arrangement of machines. In this way it maximized throughput. Electric cranes were an “inestimable boon” to production because with adequate headroom they could operate anywhere in a plant, something that mechanical power transmission to overhead cranes did not allow. Electricity made possible the use of portable power tools that could be taken anywhere in the factory. Electricity brought about improved illumination, ventilation, and cleanliness in the plants, dramatically improving working conditions. It improved the control of machines since there was no longer belt slippage with overhead line shafts and belt transmission, and there were less limitations on the operating speeds of machines. Finally, it made plant expansion much easier than when overhead shafts and belts had been relied upon for operating power.

The mechanization of American manufacturing accelerated in the 1920s, and this led to a much more rapid growth of productivity in manufacturing compared to earlier decades and to other sectors at that time. There were several forces that promoted mechanization. One was the rapidly expanding aggregate demand during the prosperous twenties. Another was the technological developments in new machines and processes, of which electrification played an important part. Finally, Harry Jerome (1934) and, later, Harry Oshima (1984) both suggest that the price of unskilled labor began to rise as immigration sharply declined with new immigration laws and falling population growth. This accelerated the mechanization of the nation's factories.

Technological changes during this period can be documented for a number of individual industries. In bituminous coal mining, labor productivity rose when mechanical loading devices reduced the labor required from 24 to 50 percent. The burst of paved road construction in the twenties led to the development of a finishing machine to smooth the surface of cement highways, and this reduced the labor requirement from 40 to 60 percent. Mechanical pavers that spread centrally mixed materials further increased productivity in road construction. These replaced the roadside dump and wheelbarrow methods of spreading the cement. Jerome (1934) reports that the glass in electric light bulbs was made by new machines that cut the number of labor-hours required for their manufacture by nearly half. New machines to produce cigarettes and cigars, for warp-tying in textile production, and for pressing clothes in clothing shops also cut labor-hours. The Banbury mixer reduced the labor input in the production of automobile tires by half, and output per worker of inner tubes increased about four times with a new production method. However, as Daniel Nelson (1987) points out, the continuing advances were the "cumulative process resulting from a vast number of successive small changes." Because of these continuing advances in the quality of the tires and in the manufacturing of tires, between 1910 and 1930 "tire costs per thousand miles of driving fell from $9.39 to $0.65."

John Lorant (1967) has documented other technological advances that occurred in American manufacturing during the twenties. For example, the organic chemical industry developed rapidly due to the introduction of the Weizman fermentation process. In a similar fashion, nearly half of the productivity advances in the paper industry were due to the "increasingly sophisticated applications of electric power and paper manufacturing processes," especially the fourdrinier paper-making machines. As Avi Cohen (1984) has shown, the continuing advances in these machines were the result of evolutionary changes to the basic machine. Mechanization in many types of mass-production industries raised the productivity of labor and capital. In the glass industry, automatic feeding and other types of fully automatic production raised the efficiency of the production of glass containers, window glass, and pressed glass. Giedion (1948) reported that the production of bread was "automatized" in all stages during the 1920s.

Though not directly bringing about productivity increases in manufacturing processes, developments in the management of manufacturing firms, particularly the largest ones, also significantly affected their structure and operation. Alfred D. Chandler, Jr. (1962) has argued that the structure of a firm must follow its strategy. Until the First World War most industrial firms were centralized, single-division firms even when becoming vertically integrated. When this began to change the management of the large industrial firms had to change accordingly.

Because of these changes in the size and structure of the firm during the First World War, E. I. du Pont de Nemours and Company was led to adopt a strategy of diversifying into the production of largely unrelated product lines. The firm found that the centralized, divisional structure that had served it so

well was not suited to this strategy, and its poor business performance led its executives to develop between 1919 and 1921 a decentralized, multidivisional structure that boosted it to the first rank among American industrial firms.

General Motors had a somewhat different problem. By 1920 it was already decentralized into separate divisions. In fact, there was so much decentralization that those divisions essentially remained separate companies and there was little coordination between the operating divisions. A financial crisis at the end of 1920 ousted W. C. Durant and brought in the du Ponts and Alfred Sloan. Sloan, who had seen the problems at GM but had been unable to convince Durant to make changes, began reorganizing the management of the company. Over the next several years Sloan and other GM executives developed the general office for a decentralized, multidivisional firm.

Though facing related problems at nearly the same time, GM and du Pont developed their decentralized, multidivisional organizations separately. As other manufacturing firms began to diversify, GM and du Pont became the models for reorganizing the management of the firms. In many industrial firms these reorganizations were not completed until well after the Second World War.

Competition, Monopoly, and the Government

The rise of big businesses, which accelerated in the postbellum period and particularly during the first great turn-of-the-century merger wave, continued in the interwar period. Between 1925 and 1939 the share of manufacturing assets held by the 100 largest corporations rose from 34.5 to 41.9 percent. (Niemi, 1980) As a public policy, the concern with monopolies diminished in the 1920s even though firms were growing larger. But the growing size of businesses was one of the convenient scapegoats upon which to blame the Great Depression.

However, the rise of large manufacturing firms in the interwar period is not so easily interpreted as an attempt to monopolize their industries. Some of the growth came about through vertical integration by the more successful manufacturing firms. Backward integration was generally an attempt to ensure a smooth supply of raw materials where that supply was not plentiful and was dispersed and firms “feared that raw materials might become controlled by competitors or independent suppliers.” (Livesay and Porter, 1969) Forward integration was an offensive tactic employed when manufacturers found that the existing distribution network proved inadequate. Livesay and Porter suggested a number of reasons why firms chose to integrate forward. In some cases they had to provide the mass distribution facilities to handle their much larger outputs; especially when the product was a new one. The complexity of some new products required technical expertise that the existing distribution system could not provide. In other cases “the high unit costs of products required consumer credit which exceeded financial capabilities of independent distributors.” Forward integration into wholesaling was more common than forward integration into retailing. The producers of automobiles, petroleum, typewriters, sewing machines, and harvesters were typical of those manufacturers that integrated all the way into retailing.

In some cases, increases in industry concentration arose as a natural process of industrial maturation. In the automobile industry, Henry Ford’s invention in 1913 of the moving assembly line—a technological innovation that changed most manufacturing—lent itself to larger factories and firms. Of the several thousand companies that had produced cars prior to 1920, 120 were still doing so then, but Ford and General Motors were the clear leaders, together producing nearly 70 percent of the cars. During the twenties, several other companies, such as Durant, Willys, and Studebaker, missed their opportunity to become more important producers, and Chrysler, formed in early 1925, became the third most

important producer by 1930. Many went out of business and by 1929 only 44 companies were still producing cars. The Great Depression decimated the industry. Dozens of minor firms went out of business. Ford struggled through by relying on its huge stockpile of cash accumulated prior to the mid-1920s, while Chrysler actually grew. By 1940, only eight companies still produced cars—GM, Ford, and Chrysler had about 85 percent of the market, while Willys, Studebaker, Nash, Hudson, and Packard shared the remainder. The rising concentration in this industry was not due to attempts to monopolize. As the industry matured, growing economies of scale in factory production and vertical integration, as well as the advantages of a widespread dealer network, led to a dramatic decrease in the number of viable firms. (Chandler, 1962 and 1964; Rae, 1984; Bernstein, 1987)

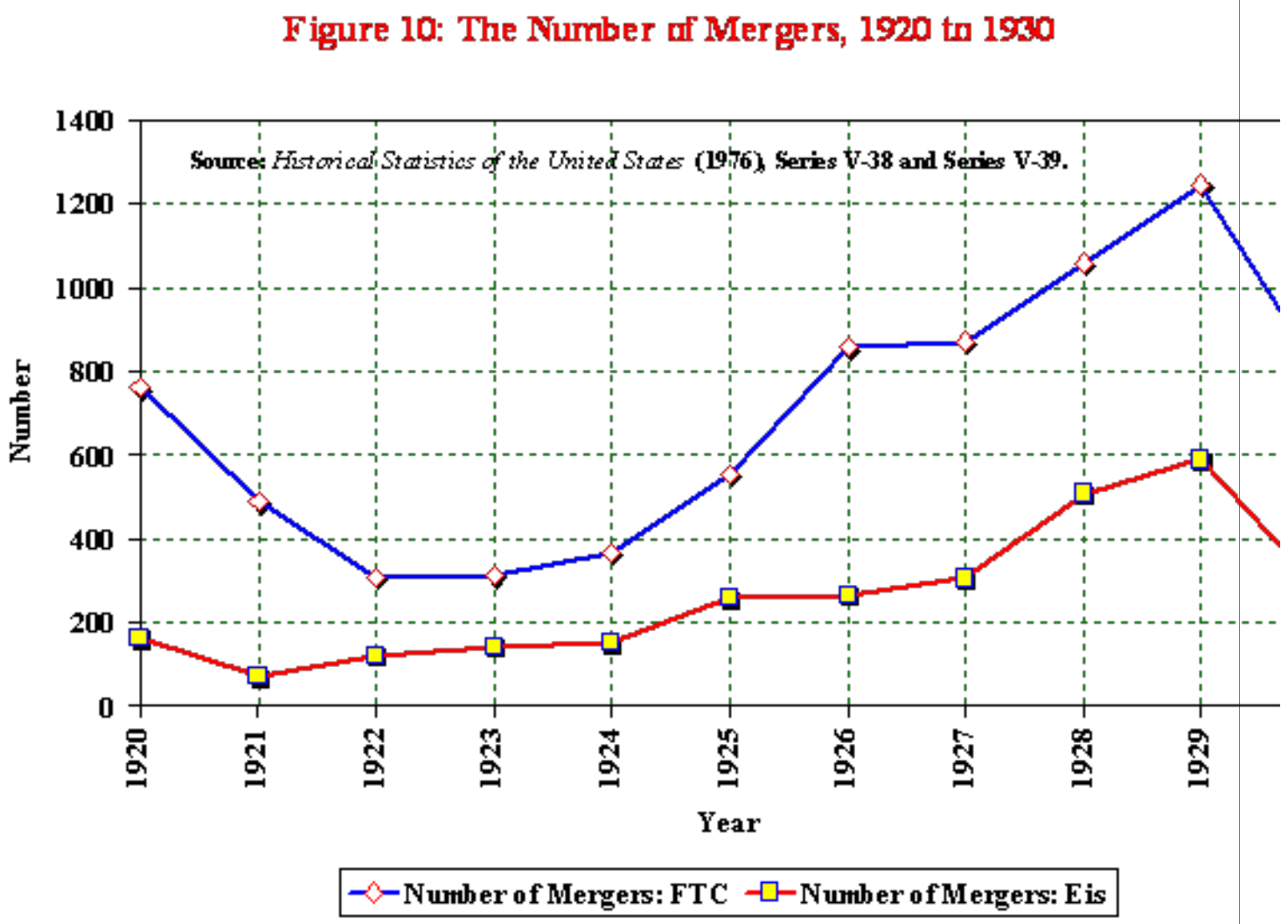
It was a similar story in the tire industry. The increasing concentration and growth of firms was driven by scale economies in production and retailing and by the devastating effects of the depression in the thirties. Although there were 190 firms in 1919, 5 firms dominated the industry—Goodyear, B. F. Goodrich, Firestone, U.S. Rubber, and Fisk, followed by Miller Rubber, General Tire and Rubber, and Kelly-Springfield. During the twenties, 166 firms left the industry while 66 entered. The share of the 5 largest firms rose from 50 percent in 1921 to 75 percent in 1937. During the depressed thirties, there was fierce price competition, and many firms exited the industry. By 1937 there were 30 firms, but the average employment per factory was 4.41 times as large as in 1921, and the average factory produced 6.87 times as many tires as in 1921. (French, 1986 and 1991; Nelson, 1987; Fricke, 1982)

The steel industry was already highly concentrated by 1920 as U.S. Steel had around 50 percent of the market. But U. S. Steel's market share declined through the twenties and thirties as several smaller firms competed and grew to become known as Little Steel, the next six largest integrated producers after U. S. Steel. Jonathan Baker (1989) has argued that the evidence is consistent with "the assumption that competition was a dominant strategy for steel manufacturers" until the depression. However, the initiation of the National Recovery Administration (NRA) codes in 1933 required the firms to cooperate rather than compete, and Baker argues that this constituted a training period leading firms to cooperate in price and output policies after 1935. (McCraw and Reinhardt, 1989; Weiss, 1980; Adams, 1977)

Mergers

A number of the larger firms grew by merger during this period, and the second great merger wave in American industry occurred during the last half of the 1920s. Figure 10 shows two series on mergers during the interwar period. The FTC series included many of the smaller mergers. The series constructed by Carl Eis (1969) only includes the larger mergers and ends in 1930.

This second great merger wave coincided with the stock market boom of the twenties and has been called "merger for oligopoly" rather than merger for monopoly. (Stigler, 1950) This merger wave created many larger firms that ranked below the industry leaders. Much of the activity in occurred in the banking and public utilities industries. (Markham, 1955) In manufacturing and mining, the effects on industrial structure were less striking. Eis (1969) found that while mergers took place in almost all industries, they were concentrated in a smaller number of them, particularly petroleum, primary metals, and food products.



The federal government's antitrust policies toward business varied sharply during the interwar period. In the 1920s there was relatively little activity by the Justice Department, but after the Great Depression the New Dealers tried to take advantage of big business to make business exempt from the antitrust laws and cartelize industries under government supervision.

With the passage of the FTC and Clayton Acts in 1914 to supplement the 1890 Sherman Act, the cornerstones of American antitrust law were complete. Though minor amendments were later enacted, the primary changes after that came in the enforcement of the laws and in swings in judicial decisions. Their two primary areas of application were in the areas of overt behavior, such as horizontal and vertical price-fixing, and in market structure, such as mergers and dominant firms. Horizontal price-fixing involves firms that would normally be competitors getting together to agree on stable and higher prices for their products. As long as most of the important competitors agree on the new, higher prices, substitution between products is eliminated and the demand becomes much less elastic. Thus, increasing the price increases the revenues and the profits of the firms who are fixing prices. Vertical price-fixing involves firms setting the prices of intermediate products purchased at different stages of production. It also tends to eliminate substitutes and makes the demand less elastic.

Price-fixing continued to be considered illegal throughout the period, but there was no major judicial activity regarding it in the 1920s other than the Trenton Potteries decision in 1927. In that decision 20 individuals and 23 corporations were found guilty of conspiring to fix the prices of bathroom bowls. The evidence in the case suggested that the firms were not very successful at doing so, but the court found that they were guilty nevertheless; their success, or lack thereof, was not held to be a factor in the decision. (Scherer and Ross, 1990) Though criticized by some, the decision was precedent setting in that

it prohibited explicit pricing conspiracies per se.

The Justice Department had achieved success in dismantling Standard Oil and American Tobacco in 1911 through decisions that the firms had *unreasonably* restrained trade. These were essentially the same points used in court decisions against the Powder Trust in 1911, the thread trust in 1913, Eastman Kodak in 1915, the glucose and cornstarch trust in 1916, and the anthracite railroads in 1920. The criterion of an *unreasonable* restraint of trade was used in the 1916 and 1918 decisions that found the American Can Company and the United Shoe Machinery Company innocent of violating the Sherman Act; it was also clearly enunciated in the 1920 U. S. Steel decision. This became known as the *rule of reason standard* in antitrust policy.

Merger policy had been defined in the 1914 Clayton Act to prohibit only the acquisition of one corporation's *stock* by another corporation. Firms then shifted to the outright purchase of a competitor's assets. A series of court decisions in the twenties and thirties further reduced the possibilities of Justice Department actions against mergers. "Only fifteen mergers were ordered dissolved through antitrust actions between 1914 and 1950, and ten of the orders were accomplished under the Sherman Act rather than Clayton Act proceedings."

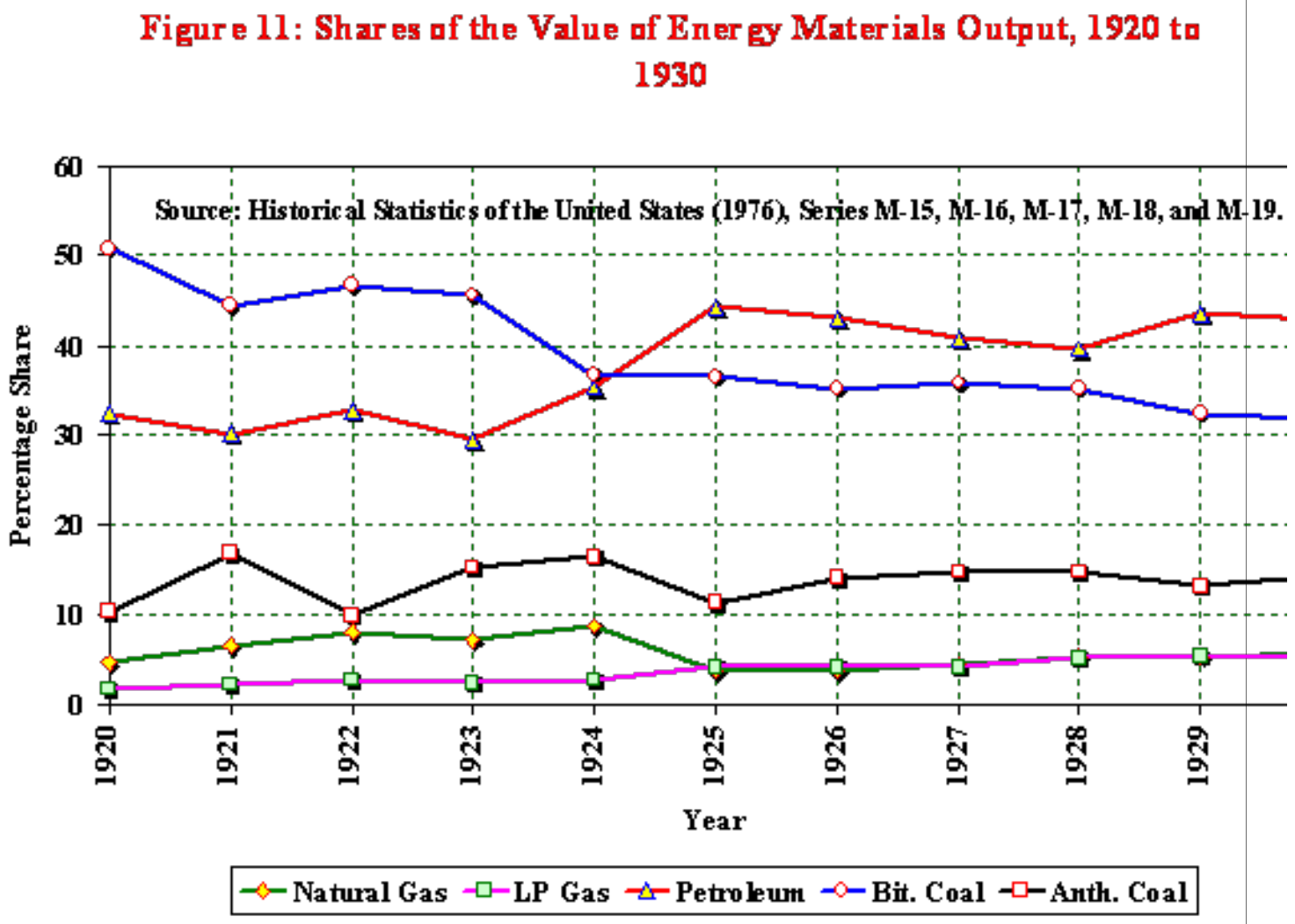
Energy

The search for energy and new ways to translate it into heat, light, and motion has been one of the unending themes in history. From whale oil to coal oil to kerosene to electricity, the search for better and less costly ways to light our lives, heat our homes, and move our machines has consumed much time and effort. The energy industries responded to those demands and the consumption of energy materials (coal, oil, gas, and fuel wood) as a percent of GNP rose from about 2 percent in the latter part of the nineteenth century to about 3 percent in the twentieth.

Changes in the energy markets that had begun in the nineteenth century continued. Processed energy in the forms of petroleum derivatives and electricity continued to become more important than "raw" energy, such as that available from coal and water. The evolution of energy sources for lighting continued; at the end of the nineteenth century, natural gas and electricity, rather than liquid fuels began to provide more lighting for streets, businesses, and homes.

In the twentieth century the continuing shift to electricity and internal combustion fuels increased the efficiency with which the American economy used energy. These processed forms of energy resulted in a more rapid increase in the productivity of labor and capital in American manufacturing. From 1899 to 1919, output per labor-hour increased at an average annual rate of 1.2 percent, whereas from 1919 to 1937 the increase was 3.5 percent per year. The productivity of capital had fallen at an average annual rate of 1.8 percent per year in the 20 years prior to 1919, but it rose 3.1 percent a year in the 18 years after 1919. As discussed above, the adoption of electricity in American manufacturing initiated a rapid evolution in the organization of plants and rapid increases in productivity in all types of manufacturing.

The change in transportation was even more remarkable. Internal combustion engines running on gasoline or diesel fuel revolutionized transportation. Cars quickly grabbed the lion's share of local and regional travel and began to eat into long distance passenger travel, just as the railroads had done to passenger traffic by water in the 1830s. Even before the First World War cities had begun passing laws to regulate and limit "jitney" services and to protect the



investments in urban rail mass transit. Trucking began eating into the freight carried by the railroads.

These developments brought about changes in the energy industries. Coal mining became a declining industry. As Figure 11 shows, in 1925 the share of petroleum in the value of coal, gas, and petroleum output exceeded bituminous coal, and it continued to rise. Anthracite coal's share was much smaller and it declined while natural gas and LP (or liquefied petroleum) gas were relatively unimportant. These changes, especially the declining coal industry, were the source of considerable worry in the twenties.

Coal

One of the industries considered to be "sick" in the twenties was coal, particularly bituminous, or soft, coal. Income in the industry declined, and bankruptcies were frequent. Strikes frequently interrupted production. The majority of the miners "lived in squalid and unsanitary houses, and the incidence of accidents and diseases was high." (Soule, 1947) The number of operating bituminous coal mines declined sharply from 1923 through 1932. Anthracite (or hard) coal output was much smaller during the twenties. Real coal prices rose from 1919 to 1922, and bituminous coal prices fell sharply from then to 1925. (Figure 12) Coal mining employment plummeted during the twenties. Annual earnings, especially in bituminous coal mining, also fell because of dwindling hourly earnings and, from 1929 on, a shrinking workweek. (Figure 13)

The sources of these changes are to be found in the increasing supply due to productivity advances in coal production and in the decreasing demand for coal. The demand fell as industries began turning from coal to electricity and because of productivity advances in the use

Figure 12: Real Coal Prices Per Short Ton, 1920 to 1930

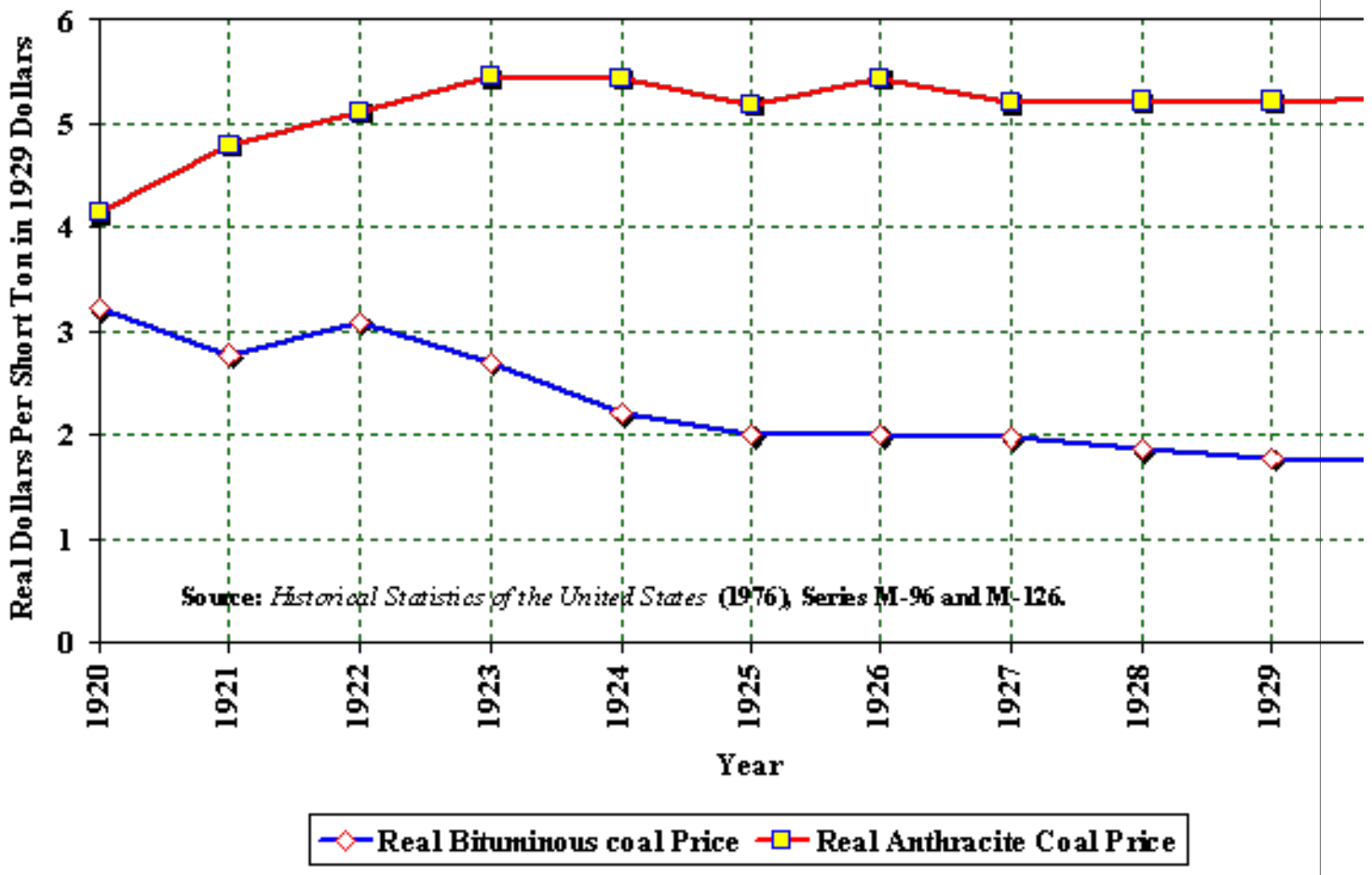
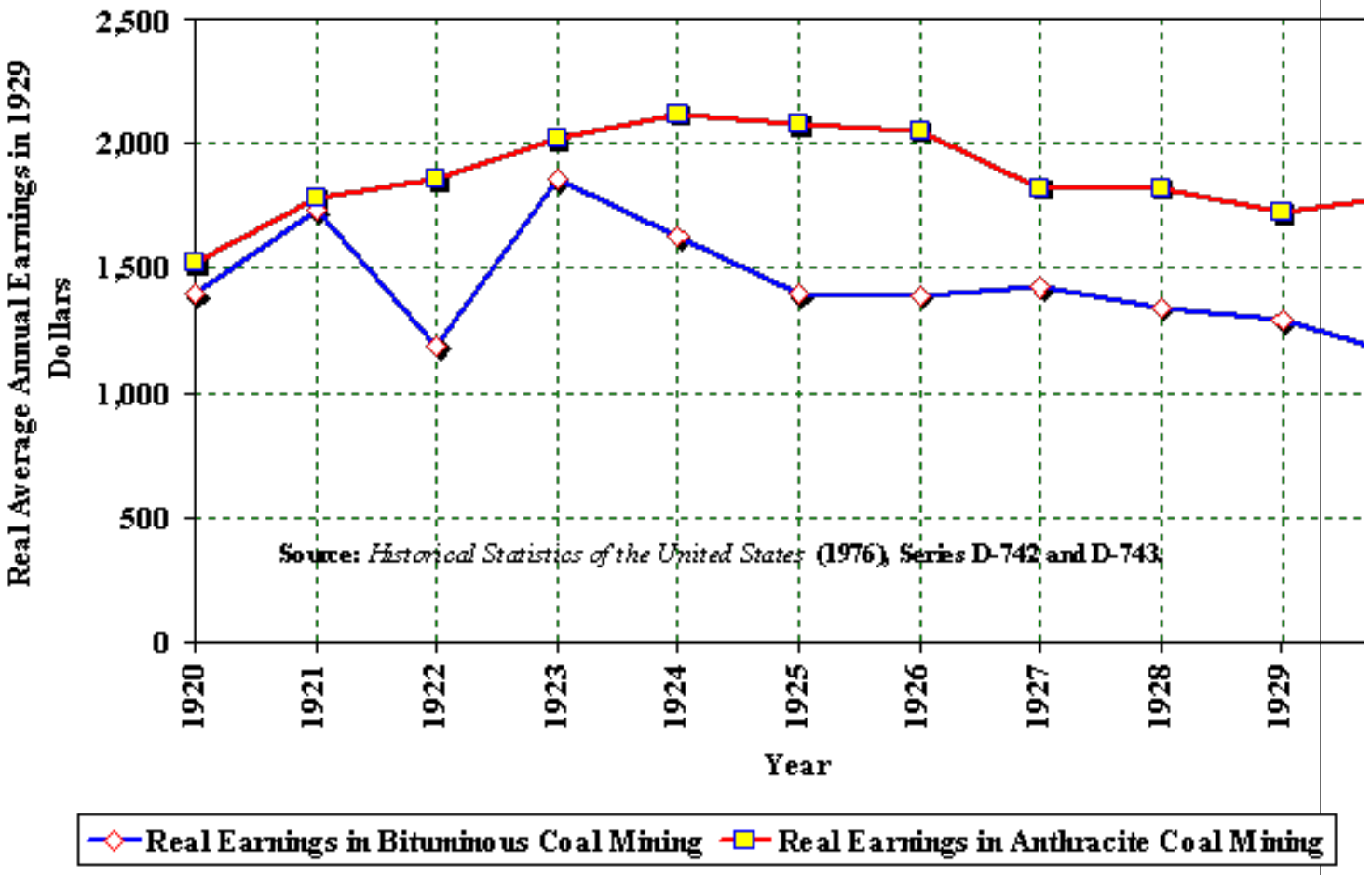


Figure 13: Real Annual Earnings in Coal Production, 1920 to 1930



of coal to create energy in steel, railroads, and electric utilities. (Keller, 1973) In the generation of electricity, larger steam plants employing higher temperatures and steam pressures continued to reduce coal consumption per kilowatt hour. Similar reductions were found in the production of coke from coal for iron and steel production and in the use of coal by the steam railroad engines. (Rezneck, 1951) All of these factors reduced the demand for coal.

Productivity advances in coal mining tended to be labor saving. Mechanical cutting accounted for 60.7 percent of the coal mined in 1920 and 78.4 percent in 1929. By the middle of the twenties, the mechanical loading of coal began to be introduced. Between 1929 and 1939, output per labor-hour rose nearly one third in bituminous coal mining and nearly four fifths in anthracite as more mines adopted machine mining and mechanical loading and strip mining expanded.

The increasing supply and falling demand for coal led to the closure of mines that were too costly to operate. A mine could simply cease operations, let the equipment stand idle, and lay off employees. When bankruptcies occurred, the mines generally just turned up under new ownership with lower capital charges. When demand increased or strikes reduced the supply of coal, idle mines simply resumed production. As a result, the easily expanded supply largely eliminated economic profits.

The average daily employment in coal mining dropped by over 208,000 from its peak in 1923, but the sharply falling real wages suggests that the supply of labor did not fall as rapidly as the demand for labor. Soule (1947) notes that when employment fell in coal mining, it meant fewer days of work for the same number of men. Social and cultural characteristics tended to tie many to their home region. The local alternatives were few, and ignorance of alternatives outside the Appalachian rural areas, where most bituminous coal was mined, made it very costly to transfer out.

Petroleum

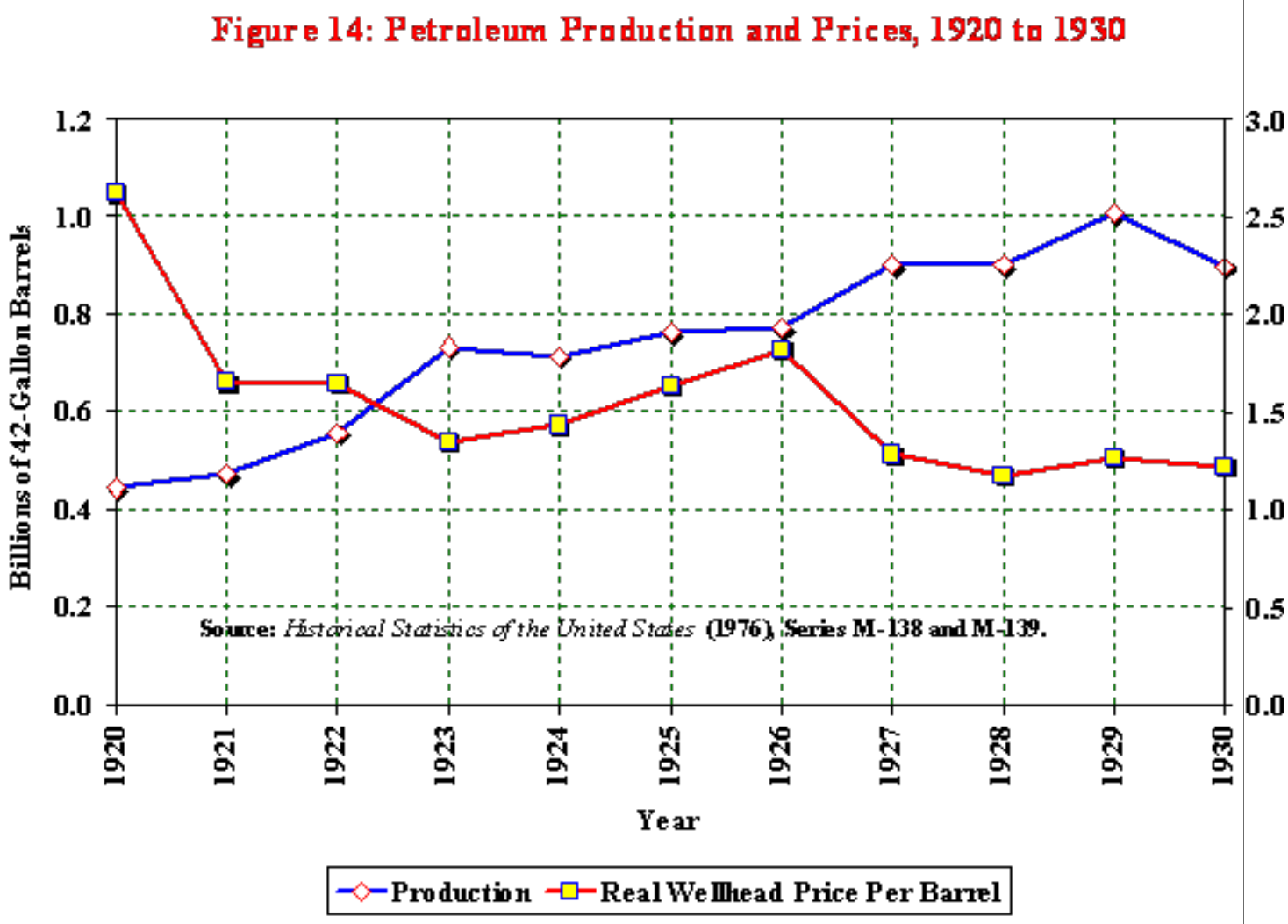
In contrast to the coal industry, the petroleum industry was growing throughout the interwar period. By the thirties, crude petroleum dominated the real value of the production of energy materials. As Figure 14 shows, the production of crude petroleum increased sharply between 1920 and 1930, while real petroleum prices, though highly variable, tended to decline.

The growing demand for petroleum was driven by the growth in demand for gasoline as America became a motorized society. The production of gasoline surpassed kerosene production in 1915. Kerosene's market continued to contract as electric lighting replaced kerosene lighting. The development of oil burners in the twenties began a switch from coal toward fuel oil for home heating, and this further increased the growing demand for petroleum. The growth in the demand for fuel oil and diesel fuel for ship engines also increased petroleum demand. But it was the growth in the demand for gasoline that drove the petroleum market.

The decline in real prices in the latter part of the twenties shows that supply was growing even faster than demand. The discovery of new fields in the early twenties increased the supply of petroleum and led to falling prices as production capacity grew. The Santa Fe Springs, California strike in 1919 initiated a supply shock as did the discovery of the Long Beach, California field in 1921. New discoveries in Powell, Texas and Smackover Arkansas further increased the supply of petroleum in 1921. New supply increases occurred in 1926 to 1928 with petroleum strikes in Seminole, Oklahoma and Hendricks, Texas. The supply of oil increased sharply in 1930 to 1931 with new discoveries in Oklahoma City and East Texas. Each new discovery pushed down real oil prices, and the prices of petroleum derivatives, and the growing production capacity led to a general declining trend in petroleum prices. McMillin and Parker

(1994) argue that supply shocks generated by these new discoveries were a factor in the business cycles during the 1920s.

The supply of gasoline increased more than the supply of crude petroleum. In 1913 a chemist at Standard Oil of Indiana introduced the cracking process to refine crude petroleum; until that time



it had been refined by distillation or unpressurized heating. In the heating process, various refined products such as kerosene, gasoline, naphtha, and lubricating oils were produced at different temperatures. It was difficult to vary the amount of the different refined products produced from a barrel of crude. The cracking process used pressurized heating to break heavier components down into lighter crude derivatives; with cracking, it was possible to increase the amount of gasoline obtained from a barrel of crude from 15 to 45 percent. In the early twenties, chemists at Standard Oil of New Jersey improved the cracking process, and by 1927 it was possible to obtain twice as much gasoline from a barrel of crude petroleum as in 1917.

The petroleum companies also developed new ways to distribute gasoline to motorists that made it more convenient to purchase gasoline. Prior to the First World War, gasoline was commonly purchased in one- or five-gallon cans and the purchaser used a funnel to pour the gasoline from the can into the car. Then “filling stations” appeared, which specialized in filling cars’ tanks with gasoline. These spread rapidly, and by 1919 gasoline companies were

Figure 15: Electricity Production and Generating Capacity, 1920 to 1930

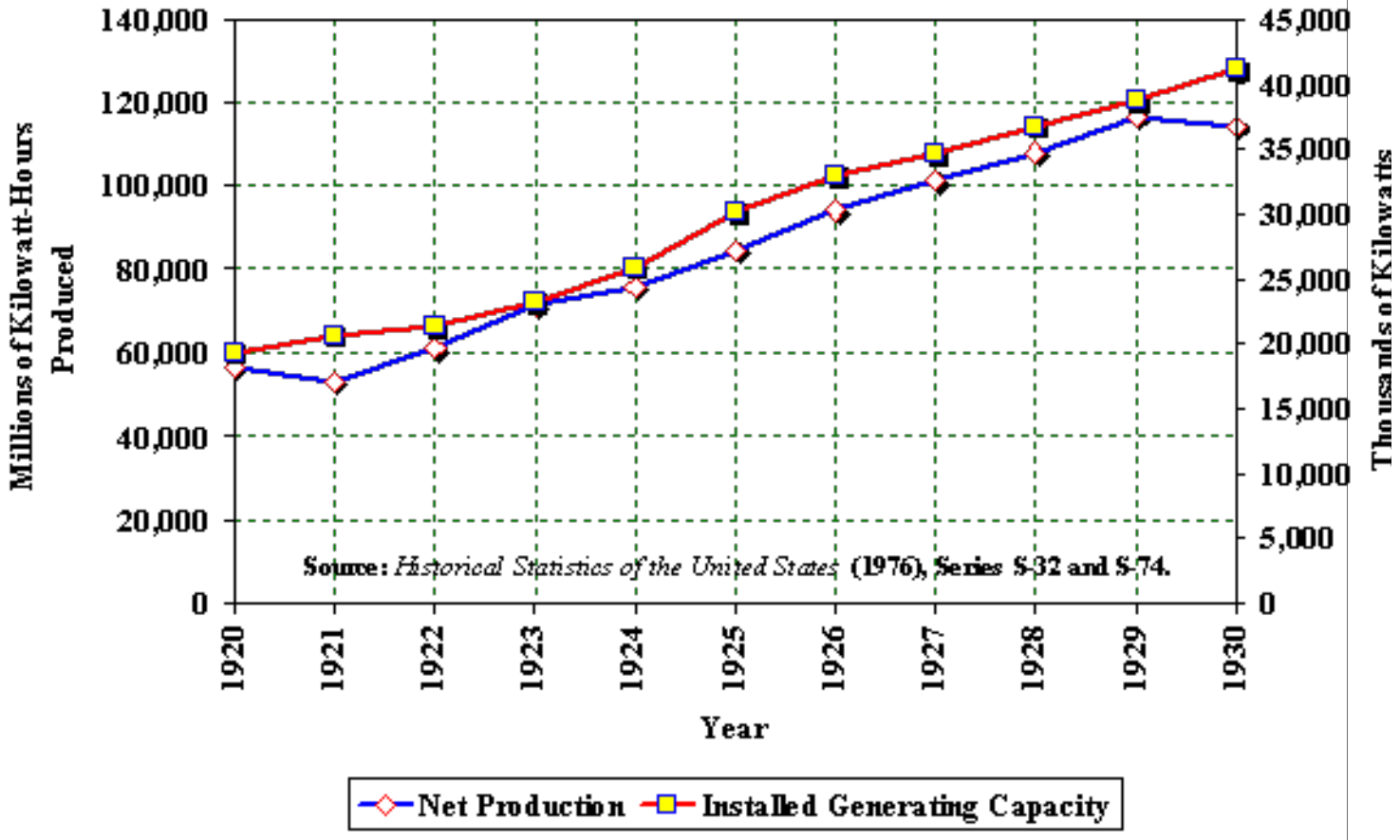
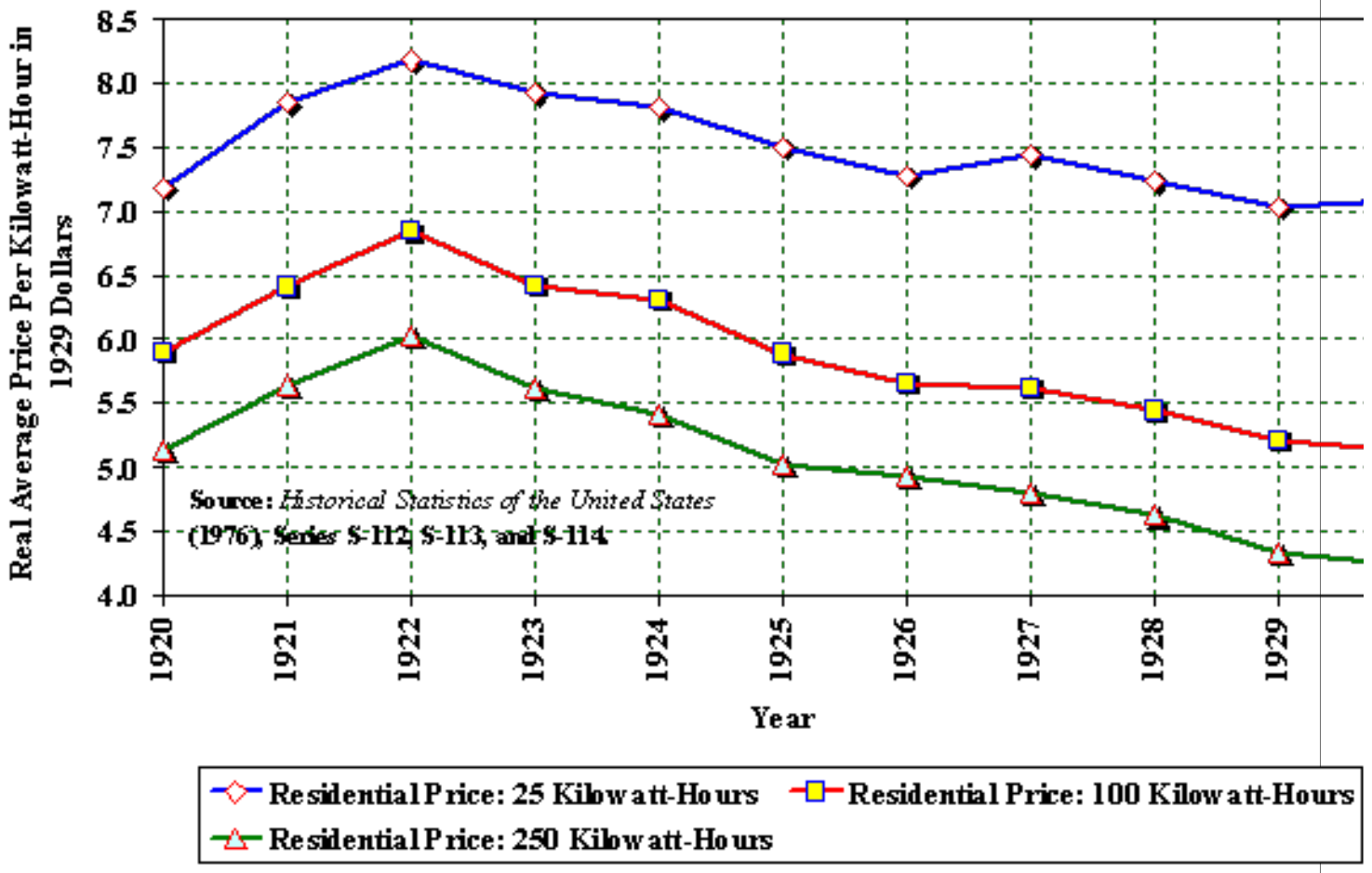


Figure 16: Electricity Prices, 1920 to 1930



beginning to introduce their own filling stations or contract with independent stations to exclusively distribute their gasoline. Increasing competition and falling profits led filling station operators to expand into other activities such as oil changes and other mechanical repairs. The general name attached to such stations gradually changed to "service stations" to reflect these new functions.

Though the petroleum firms tended to be large, they were highly competitive, trying to pump as much petroleum as possible to increase their share of the fields. This, combined with the development of new fields, led to an industry with highly volatile prices and output. Firms desperately wanted to stabilize and reduce the production of crude petroleum so as to stabilize and raise the prices of crude petroleum and refined products. Unable to obtain voluntary agreement on output limitations by the firms and producers, governments began stepping in. Led by Texas, which created the Texas Railroad Commission in 1891, oil-producing states began to intervene to regulate production. Such laws were usually termed *prorationing laws* and were quotas designed to limit each well's output to some fraction of its potential. The purpose was as much to stabilize and reduce production and raise prices as anything else, although generally such laws were passed under the guise of conservation. Although the federal government supported such attempts, not until the New Deal were federal laws passed to assist this.

Electricity

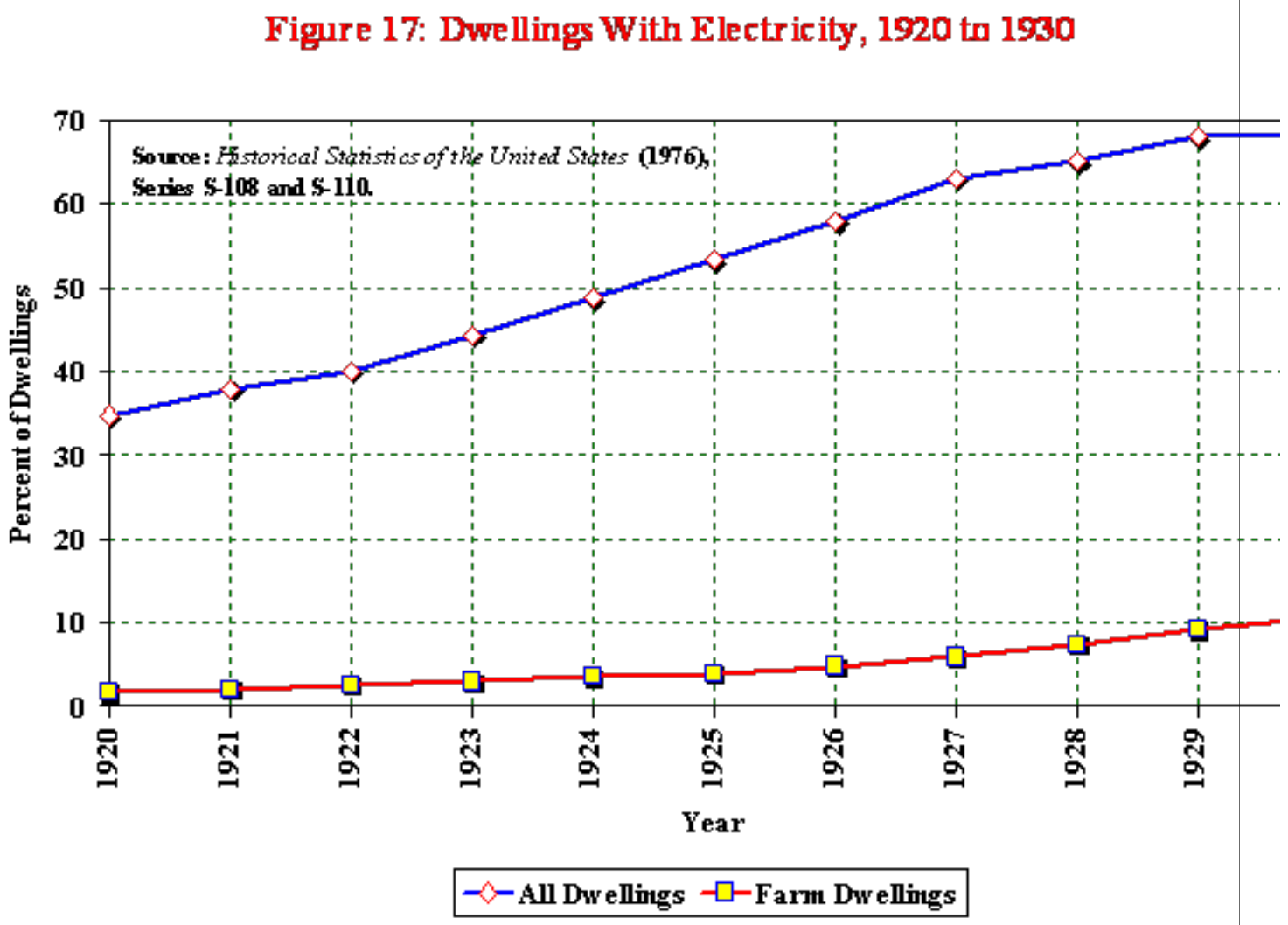
By the mid 1890s the debate over the method by which electricity was to be transmitted had been won by those who advocated alternating current. The reduced power losses and greater distance over which electricity could be transmitted more than offset the necessity for transforming the current back to direct current for general use. Widespread adoption of machines and appliances by industry and consumers then rested on an increase in the array of products using electricity as the source of power, heat, or light and the development of an efficient, lower cost method of generating electricity.

General Electric, Westinghouse, and other firms began producing the electrical appliances for homes and an increasing number of machines based on electricity began to appear in industry. The problem of lower cost production was solved by the introduction of centralized generating facilities that distributed the electric power through lines to many consumers and business firms.

Though initially several firms competed in generating and selling electricity to consumers and firms in a city or area, by the First World War many states and communities were awarding exclusive franchises to one firm to generate and distribute electricity to the customers in the franchise area. (Bright, 1947; Passer, 1953) The electric utility industry became an important growth industry and, as Figure 15 shows, electricity production and use grew rapidly.

The electric utilities increasingly were regulated by state commissions that were charged with setting rates so that the utilities could receive a "fair return" on their investments. Disagreements over what constituted a "fair return" and the calculation of the rate base led to a steady stream of cases before the commissions and a continuing series of court appeals. Generally these court decisions favored the reproduction cost basis. Because of the difficulty and cost in making these calculations, rates tended to be in the hands of the electric utilities that, it has been suggested, did not lower rates adequately to reflect the rising productivity and lowered costs of production. The utilities argued that a more rapid lowering of rates would have jeopardized their profits. Whether or not this increased their monopoly power is still an open question, but it should be noted, that electric utilities were hardly price-taking industries prior to regulation. (Mercer, 1973) In fact, as Figure 16 shows, the electric utilities began to systematically practice market segmentation charging users with less elastic demands, higher prices per

kilowatt-hour.



Energy in the American Economy of the 1920s

The changes in the energy industries had far-reaching consequences. The coal industry faced a continuing decline in demand. Even in the growing petroleum industry, the periodic surges in the supply of petroleum caused great instability. In manufacturing, as described above, electrification contributed to a remarkable rise in productivity. The transportation revolution brought about by the rise of gasoline-powered trucks and cars changed the way businesses received their supplies and distributed their production as well as where they were located. The suburbanization of America and the beginnings of urban sprawl were largely brought about by the introduction of low-priced gasoline for cars.

Transportation

The American economy was forever altered by the dramatic changes in transportation after 1900. Following Henry Ford's introduction of the moving assembly production line in 1914, automobile prices plummeted, and by the end of the 1920s about 60 percent of American families owned an automobile. The advent of low-cost personal transportation led to an accelerating movement of population out of the crowded cities to more spacious homes in the suburbs and the automobile set off a decline in intracity public passenger transportation that has yet to end. Massive road-building programs facilitated the intercity movement of people and goods. Trucks increasingly took over the movement of freight in competition with the railroads. New industries, such as gasoline service stations, motor hotels, and the rubber tire industry, arose to service the automobile and truck traffic. These developments were complicated by the turmoil caused by changes in the federal government's policies toward

transportation in the United States.

With the end of the First World War, a debate began as to whether the railroads, which had been taken over by the government, should be returned to private ownership or nationalized. The voices calling for a return to private ownership were much stronger, but doing so fomented great controversy. Many in Congress believed that careful planning and consolidation could restore the railroads and make them more efficient. There was continued concern about the near monopoly that the railroads had on the nation's intercity freight and passenger transportation. The result of these deliberations was the Transportation Act of 1920, which was premised on the continued domination of the nation's transportation by the railroads—an erroneous presumption.

The Transportation Act of 1920 presented a marked change in the Interstate Commerce Commission's ability to control railroads. The ICC was allowed to prescribe exact rates that were to be set so as to allow the railroads to earn a fair return, defined as 5.5 percent, on the fair value of their property. The ICC was authorized to make an accounting of the fair value of each regulated railroad's property; however, this was not completed until well into the 1930s, by which time the accounting and rate rules were out of date. To maintain fair competition between railroads in a region, all roads were to have the same rates for the same goods over the same distance. With the same rates, low-cost roads should have been able to earn higher rates of return than high-cost roads. To handle this, a recapture clause was inserted: any railroad earning a return of more than 6 percent on the fair value of its property was to turn the excess over to the ICC, which would place half of the money in a contingency fund for the railroad when it encountered financial problems and the other half in a contingency fund to provide loans to other railroads in need of assistance.

In order to address the problem of weak and strong railroads and to bring better coordination to the movement of rail traffic in the United States, the act was directed to encourage railroad consolidation, but little came of this in the 1920s. In order to facilitate its control of the railroads, the ICC was given two additional powers. The first was the control over the issuance or purchase of securities by railroads, and the second was the power to control changes in railroad service through the control of car supply and the extension and abandonment of track. The control of the supply of rail cars was turned over to the Association of American Railroads. Few extensions of track were proposed, but as time passed, abandonment requests grew. The ICC, however, trying to mediate between the conflicting demands of shippers, communities and railroads, generally refused to grant abandonments, and this became an extremely sensitive issue in the 1930s.

As indicated above, the premises of the Transportation Act of 1920 were wrong. Railroads experienced increasing competition during the 1920s, and both freight and passenger traffic were drawn off to competing transport forms. Passenger traffic exited from the railroads much more quickly. As the network of all weather surfaced roads increased, people quickly turned from the train to the car. Harmed even more by the move to automobile traffic were the electric interurban railways that had grown rapidly just prior to the First World War. (Hilton-Due, 1960) Not surprisingly, during the 1920s few railroads earned profits in excess of the fair rate of return.

The use of trucks to deliver freight began shortly after the turn of the century. Before the outbreak of war in Europe, White and Mack were producing trucks with as much as 7.5 tons of carrying capacity. Most of the truck freight was carried on a local basis, and it largely supplemented the longer distance freight transportation provided by the railroads. However, truck size was growing. In 1915 Trailmobile introduced the first four-wheel trailer designed to be pulled by a truck tractor unit. During the First

World War, thousands of trucks were constructed for military purposes, and truck convoys showed that long distance truck travel was feasible and economical. The use of trucks to haul freight had been growing by over 18 percent per year since 1925, so that by 1929 intercity trucking accounted for more than one percent of the ton-miles of freight hauled.

The railroads argued that the trucks and buses provided "unfair" competition and believed that if they were also regulated, then the regulation could equalize the conditions under which they competed. As early as 1925, the National Association of Railroad and Utilities Commissioners issued a call for the regulation of motor carriers in general. In 1928 the ICC called for federal regulation of buses and in 1932 extended this call to federal regulation of trucks.

Most states had began regulating buses at the beginning of the 1920s in an attempt to reduce the diversion of urban passenger traffic from the electric trolley and railway systems. However, most of the regulation did not aim to control intercity passenger traffic by buses. As the network of surfaced roads expanded during the twenties, so did the routes of the intercity buses. In 1929 a number of smaller bus companies were incorporated in the Greyhound Buslines, the carrier that has since dominated intercity bus transportation. (Walsh, 2000)

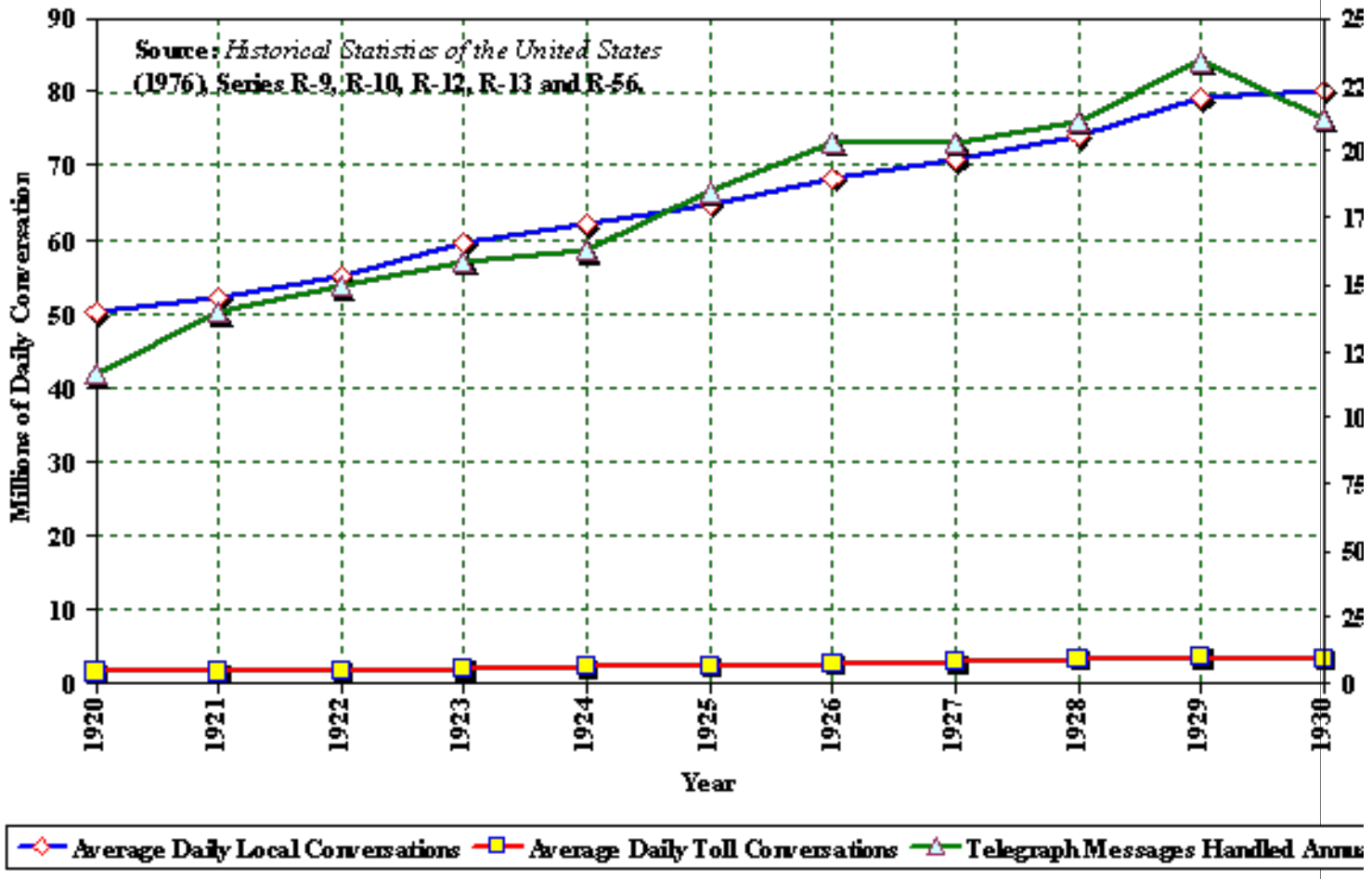
A complaint of the railroads was that interstate trucking competition was unfair because it was subsidized while railroads were not. All railroad property was privately owned and subject to property taxes, whereas truckers used the existing road system and therefore neither had to bear the costs of creating the road system nor pay taxes upon it. Beginning with the Federal Road-Aid Act of 1916, small amounts of money were provided as an incentive for states to construct rural post roads. (Dearing-Owen, 1949) However, through the First World War most of the funds for highway construction came from a combination of levies on the adjacent property owners and county and state taxes. The monies raised by the counties were commonly 60 percent of the total funds allocated, and these primarily came from property taxes. In 1919 Oregon pioneered the state gasoline tax, which then began to be adopted by more and more states. A highway system financed by property taxes and other levies can be construed as a subsidization of motor vehicles, and one study for the period up to 1920 found evidence of substantial subsidization of trucking. (Herbst-Wu, 1973) However, the use of gasoline taxes moved closer to the goal of users paying the costs of the highways. Neither did the trucks have to pay for all of the highway construction because automobiles jointly used the highways. Highways had to be constructed in more costly ways in order to accommodate the larger and heavier trucks. Ideally the gasoline taxes collected from trucks should have covered the extra (or marginal) costs of highway construction incurred because of the truck traffic. Gasoline taxes tended to do this.

The American economy occupies a vast geographic region. Because economic activity occurs over most of the country, falling transportation costs have been crucial to knitting American firms and consumers into a unified market. Throughout the nineteenth century the railroads played this crucial role. Because of the size of the railroad companies and their importance in the economic life of Americans, the federal government began to regulate them. But, by 1917 it appeared that the railroad system had achieved some stability, and it was generally assumed that the post-First World War era would be an extension of the era from 1900 to 1917. Nothing could have been further from the truth. Spurred by public investments in highways, cars and trucks voraciously ate into the railroad's market, and, though the regulators failed to understand this at the time, the railroad's monopoly on transportation quickly disappeared.

Communications

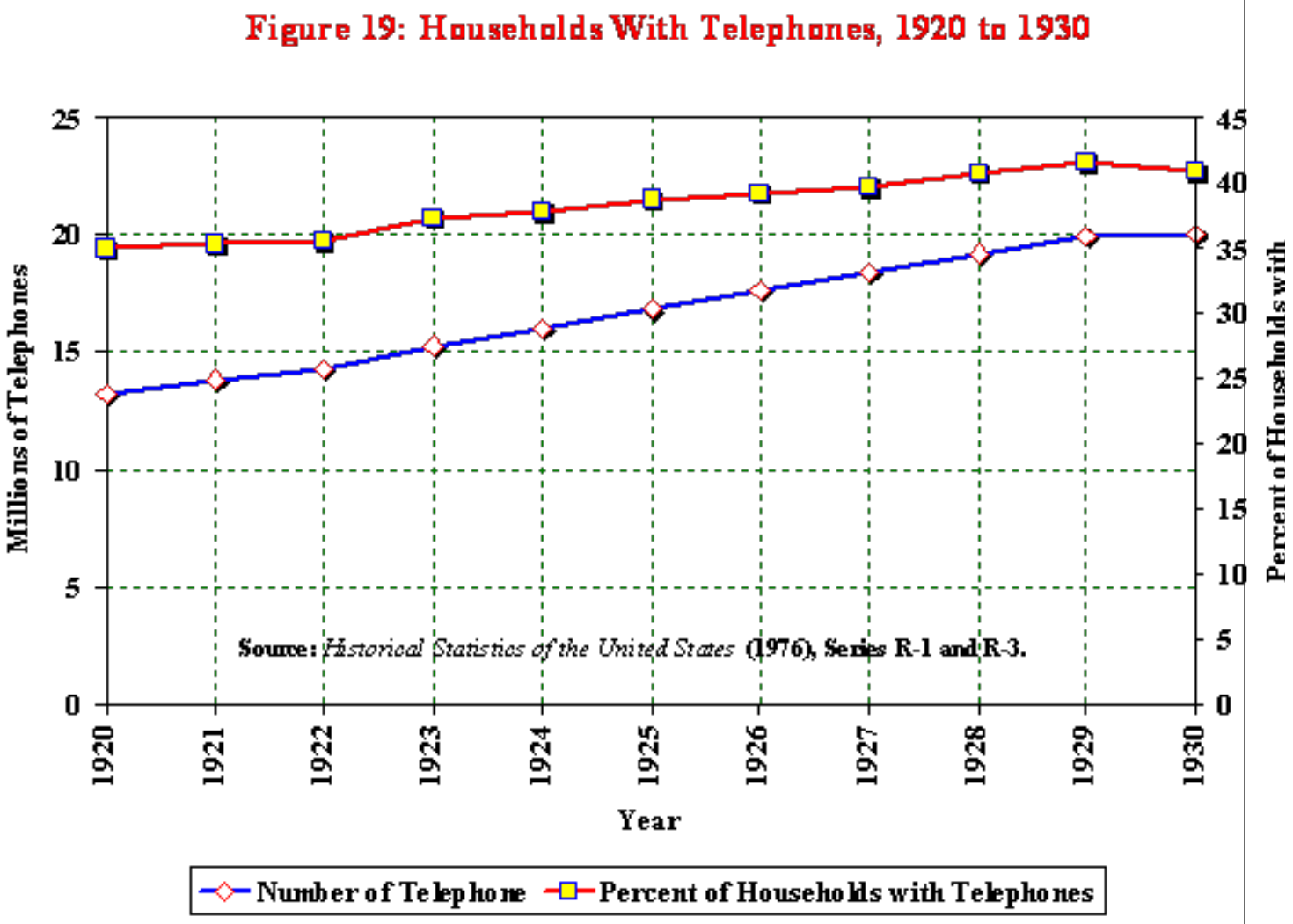
Communications had joined with transportation developments in the nineteenth century to tie the American economy together more completely. The telegraph had benefited by using the railroads' right-of-ways, and the railroads used the telegraph to coordinate and organize their far-flung activities. As the cost of communications fell and information transfers sped, the development of firms with multiple plants at distant locations was facilitated. The interwar era saw a continuation of these developments as the telephone continued to supplant the telegraph and the new medium of radio arose to transmit news and provide a new entertainment source.

Figure 18: Telephone Conversations and Telegraph Messages, 1920 to 1930



Telegraph domination of business and personal communications had given way to the telephone as long distance telephone calls between the east and west coasts with the new electronic amplifiers became possible in 1915. The number of telegraph messages handled grew 60.4 percent in the twenties. The number of local telephone conversations grew 46.8 percent between 1920 and 1930, while the number of long distance conversations grew 71.8 percent over the same period. There were 5 times as many long distance telephone calls as telegraph messages handled in 1920, and 5.7 times as many in 1930.

The twenties were a prosperous period for AT&T and its 18 major operating companies. (Brooks, 1975; Temin, 1987; Garnet, 1985; Lipartito, 1989) Telephone usage rose and, as Figure 19 shows, the share of all households with a telephone rose from 35 percent to nearly 42 percent. In cities across the nation, AT&T consolidated its system, gained control of many operating companies, and virtually eliminated its competitors. It was able to do this because in 1921 Congress passed the Graham Act exempting AT&T from the Sherman Act in consolidating competing telephone companies. By 1940, the non-Bell operating companies were all small relative to the Bell operating companies.



Surprisingly there was a decline in telephone use on the farms during the twenties. (Hadwiger-Cochran, 1984; Fischer 1987) Rising telephone rates explain part of the decline in rural use. The imposition of connection fees during the First World War made it more costly for new farmers to hook up. As AT&T gained control of more and more operating systems, telephone rates were increased. AT&T also began requiring, as a condition of interconnection, that independent companies upgrade their systems to meet AT&T standards. Most of the small mutual companies that had provided service to farmers had operated on a shoestring—wires were often strung along fenceposts, and phones were inexpensive "whoop and holler" magneto units. Upgrading to AT&T's standards raised costs, forcing these companies to raise rates.

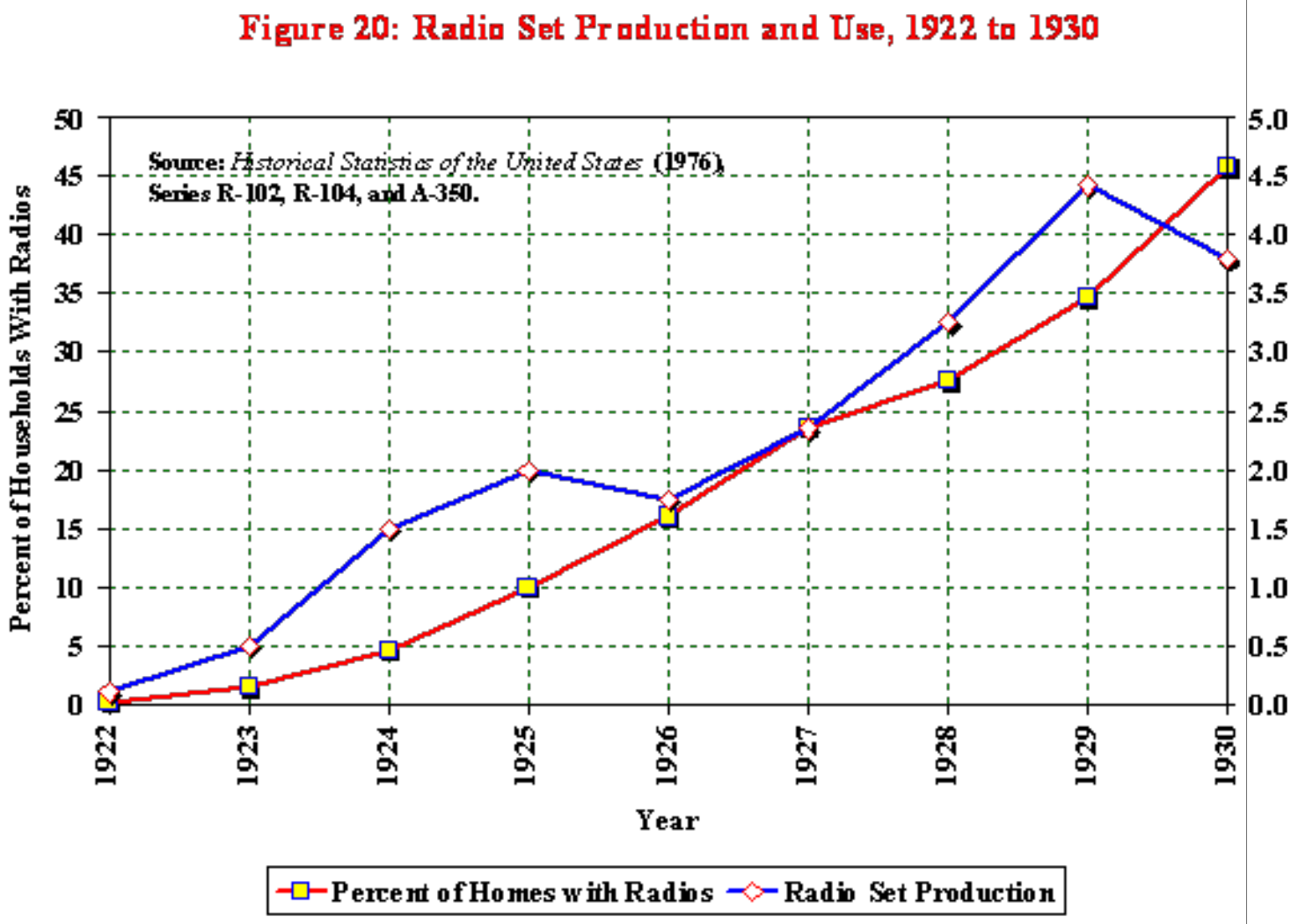
However, it also seems likely that during the 1920s there was a general decline in the rural demand for telephone services. One important factor in this was the dramatic decline in farm incomes in the early twenties. The second reason was a change in the farmers' environment. Prior to the First World War, the telephone eased farm isolation and provided news and weather information that was otherwise hard to obtain. After 1920 automobiles, surfaced roads, movies, and the radio loosened the isolation and the telephone was no longer as crucial.

Othmar Merganthaler's development of the linotype machine in the late nineteenth century had irrevocably altered printing and publishing. This machine, which quickly created a line of soft, lead-based metal type that could be printed, melted down and then recast as a new line of type, dramatically lowered the costs of printing. Previously, all type had to be painstakingly set by hand, with individual cast letter matrices picked out from compartments in drawers to construct words, lines, and paragraphs. After printing, each line of type on the page had to be broken down and each individual letter matrix

placed back into its compartment in its drawer for use in the next printing job. Newspapers often were not published every day and did not contain many pages, resulting in many newspapers in most cities. In contrast to this laborious process, the linotype used a keyboard upon which the operator typed the words in one of the lines in a news column. Matrices for each letter dropped down from a magazine of matrices as the operator typed each letter and were assembled into a line of type with automatic spacers to justify the line (fill out the column width). When the line was completed the machine mechanically cast the line of matrices into a line of lead type. The line of lead type was ejected into a tray and the letter matrices mechanically returned to the magazine while the operator continued typing the next line in the news story. The first Merganthaler linotype machine was installed in the New York Tribune in 1886. The linotype machine dramatically lowered the costs of printing newspapers (as well as books and magazines). Prior to the linotype a typical newspaper averaged no more than 11 pages and many were published only a few times a week. The linotype machine allowed newspapers to grow in size and they began to be published more regularly. A process of consolidation of daily and Sunday newspapers began that continues to this day. Many have termed the Merganthaler linotype machine the most significant printing invention since the introduction of movable type 400 years earlier.

For city families as well as farm families, radio became the new source of news and entertainment. (Barnouw, 1966; Rosen, 1980 and 1987; Chester-Garrison, 1950) It soon took over as the prime advertising medium and in the process revolutionized advertising. By 1930 more homes had radio sets than had telephones. The radio networks sent news and entertainment broadcasts all over the country. The isolation of rural life, particularly in many areas of the plains, was forever broken by the intrusion of the “black box,” as radio receivers were often called. The radio began a process of breaking down regionalism and creating a common culture in the United States.

The potential demand for radio became clear with the first regular broadcast of Westinghouse’s KDKA in Pittsburgh in the fall of 1920. Because the Department of Commerce could not deny a license application there was an explosion of stations all broadcasting at the same frequency and signal jamming and interference became a serious problem. By 1923 the Department of Commerce had gained control of radio from the Post Office and the Navy and began to arbitrarily disperse stations on the radio dial and deny licenses creating the first market in commercial broadcast licenses. In 1926 a U.S. District Court decided that under the Radio Law of 1912 Herbert Hoover, the secretary of commerce, did not have this power. New stations appeared and the logjam and interference of signals worsened. A Radio Act was passed in January of 1927 creating the Federal Radio Commission (FRC) as a temporary licensing authority. Licenses were to be issued in the public interest, convenience, and necessity. A number of broadcasting licenses were revoked; stations were assigned frequencies, dial locations, and power levels. The FRC created 24 clear-channel stations with as much as 50,000



watts of broadcasting power, of which 21 ended up being affiliated with the new national radio networks. The Communications Act of 1934 essentially repeated the 1927 act except that it created a permanent, seven-person Federal Communications Commission (FCC).

Local stations initially created and broadcast the radio programs. The expenses were modest, and stores and companies operating radio stations wrote this off as indirect, goodwill advertising. Several forces changed all this. In 1922, AT&T opened up a radio station in New York City, WEAF (later to become WNBC). AT&T envisioned this station as the center of a radio toll system where individuals could purchase time to broadcast a message transmitted to other stations in the toll network using AT&T's long distance lines and an August 1922 broadcast by a Long Island realty company became the first conscious use of direct advertising.

Though advertising continued to be condemned, the fiscal pressures on radio stations to accept advertising began rising. In 1923 the American Society of Composers and Publishers (ASCAP), began demanding a performance fee anytime ASCAP-copyrighted music was performed on the radio, either live or on record. By 1924 the issue was settled, and most stations began paying performance fees to ASCAP. AT&T decided that all stations broadcasting with non AT&T transmitters were violating their patent rights and began asking for annual fees from such stations based on the station's power. By the end of 1924, most stations were paying the fees. All of this drained the coffers of the radio stations, and more and more of them began discreetly accepting advertising.

RCA became upset at AT&T's creation of a chain of radio stations and set up its own toll network using the inferior lines of Western Union and Postal Telegraph, because AT&T, not surprisingly, did not allow any toll (or network) broadcasting on its lines except by its own stations. AT&T began to worry that its

actions might threaten its federal monopoly in long distance telephone communications. In 1926 a new firm was created, the National Broadcasting Company (NBC), which took over all broadcasting activities from AT&T and RCA as AT&T left broadcasting. When NBC debuted in November of 1926, it had two networks: the Red, which was the old AT&T network, and the Blue, which was the old RCA network. Radio networks allowed advertisers to direct advertising at a national audience at a lower cost. Network programs allowed local stations to broadcast superior programs that captured a larger listening audience and in return received a share of the fees the national advertiser paid to the network. In 1927 a new network, the Columbia Broadcasting System (CBS) financed by the Paley family began operation and other new networks entered or tried to enter the industry in the 1930s.

Communications developments in the interwar era present something of a mixed picture. By 1920 long distance telephone service was in place, but rising rates slowed the rate of adoption in the period, and telephone use in rural areas declined sharply. Though direct dialing was first tried in the twenties, its general implementation would not come until the postwar era, when other changes, such as microwave transmission of signals and touch-tone dialing, would also appear. Though the number of newspapers declined, newspaper circulation generally held up. The number of competing newspapers in larger cities began declining, a trend that also would accelerate in the postwar American economy.

Banking and Securities Markets

In the twenties commercial banks became "department stores of finance."— Banks opened up installment (or personal) loan departments, expanded their mortgage lending, opened up trust departments, undertook securities underwriting activities, and offered safe deposit boxes. These changes were a response to growing competition from other financial intermediaries. Businesses, stung by bankers' control and reduced lending during the 1920-21 depression, began relying more on retained earnings and stock and bond issues to raise investment and, sometimes, working capital. This reduced loan demand. The thrift institutions also experienced good growth in the twenties as they helped fuel the housing construction boom of the decade. The securities markets boomed in the twenties only to see a dramatic crash of the stock market in late 1929.

There were two broad classes of commercial banks; those that were nationally chartered and those that were chartered by the states. Only the national banks were required to be members of the Federal Reserve System. (Figure 21) Most banks were unit banks because national regulators and most state regulators prohibited branching. However, in the twenties a few states began to permit limited branching; California even allowed statewide branching.—The Federal Reserve member banks held the bulk of the assets of all commercial banks, even though most banks were not members. A high bank failure rate in the 1920s has usually been explained by "overbanking" or too many banks located in an area, but H. Thomas Johnson (1973-74) makes a strong argument against this. (Figure 22)— If there were overbanking, on average each bank would have been underutilized resulting in intense competition for deposits and higher costs and lower earnings. One common reason would have been the free entry of banks as long as they achieved the minimum requirements then in force. However, the twenties saw changes that led to the demise of many smaller rural banks that would likely have been profitable if these

Figure 21: Commercial Banks, 1920 to 1930

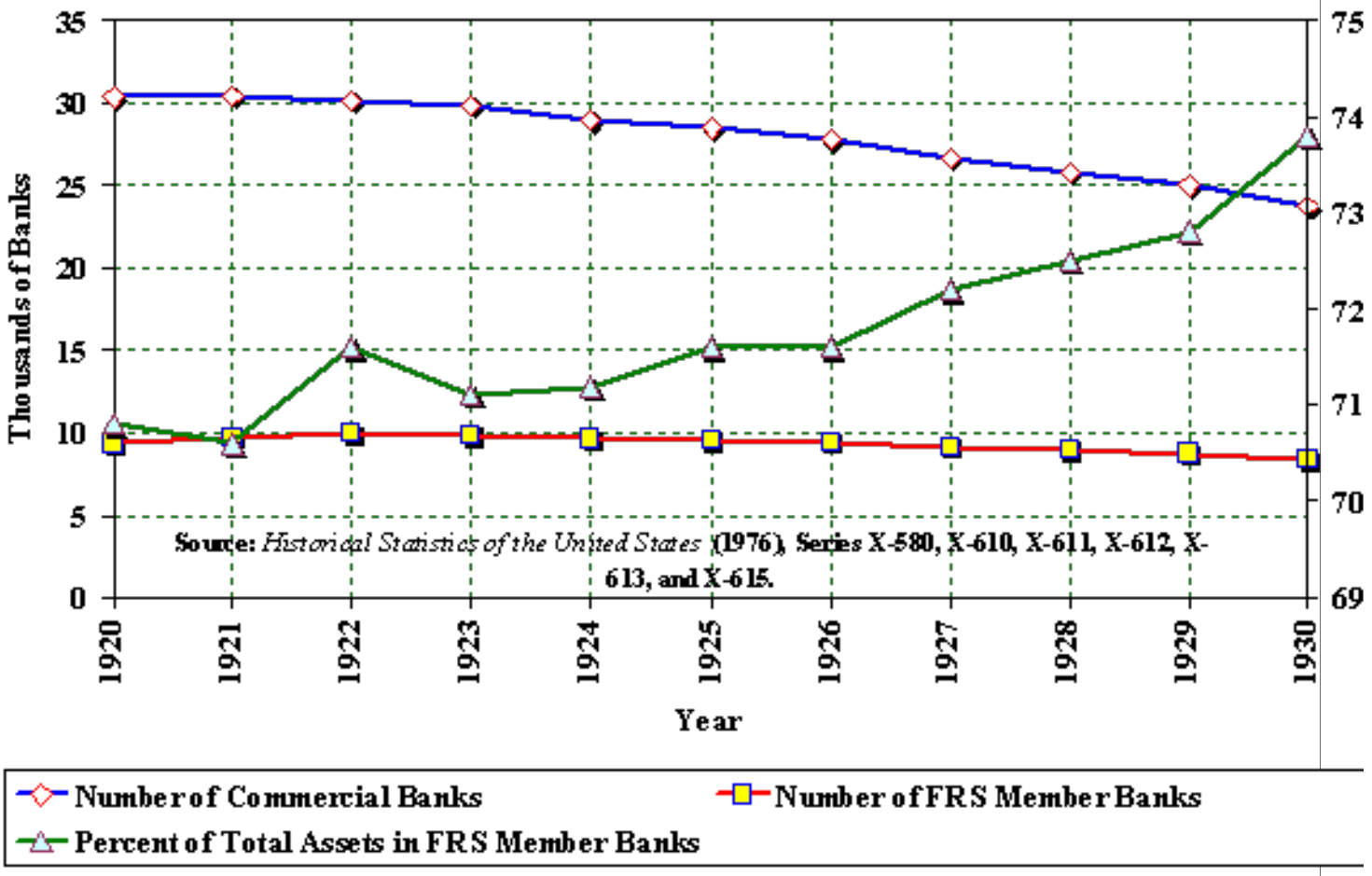
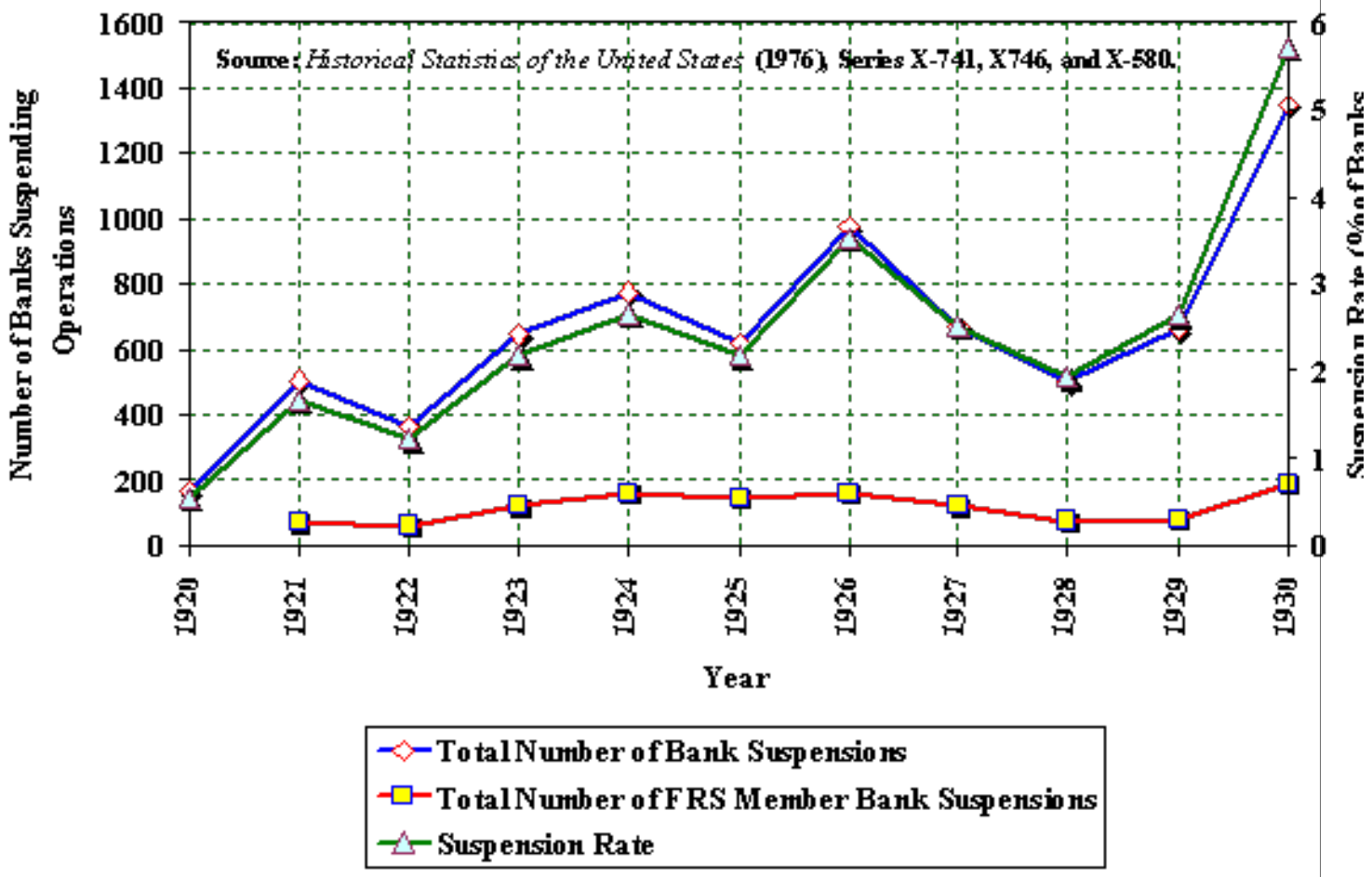


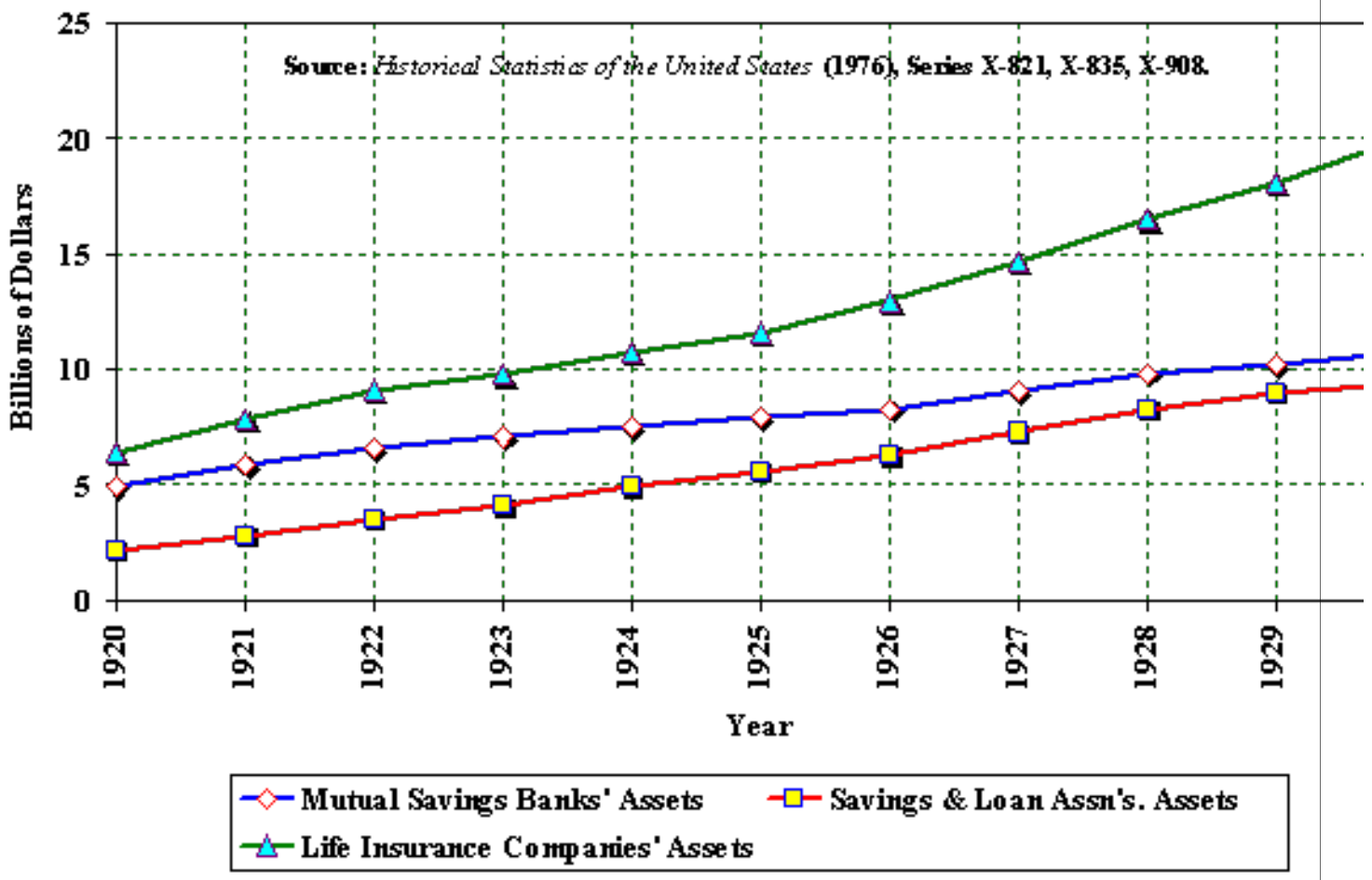
Figure 22: Bank Suspensions



changes had not occurred. Improved transportation led to a movement of business activities, including banking, into the larger towns and cities. Rural banks that relied on loans to farmers suffered just as farmers did during the twenties, especially in the first half of the twenties. The number of bank suspensions and the suspension rate fell after 1926. The sharp rise in bank suspensions in 1930 occurred because of the first banking crisis during the Great Depression.

Prior to the twenties, the main assets of commercial banks were short-term business loans, made by creating a demand deposit or increasing an existing one for a borrowing firm. As business lending declined in the 1920s commercial banks vigorously moved into new types of financial activities. As banks purchased more securities for their earning asset portfolios and gained expertise in the securities markets, larger ones established investment departments and by the late twenties were an important force in the underwriting of new securities issued by nonfinancial corporations.

Figure 23: Assets of Nonbank Financial Intermediaries

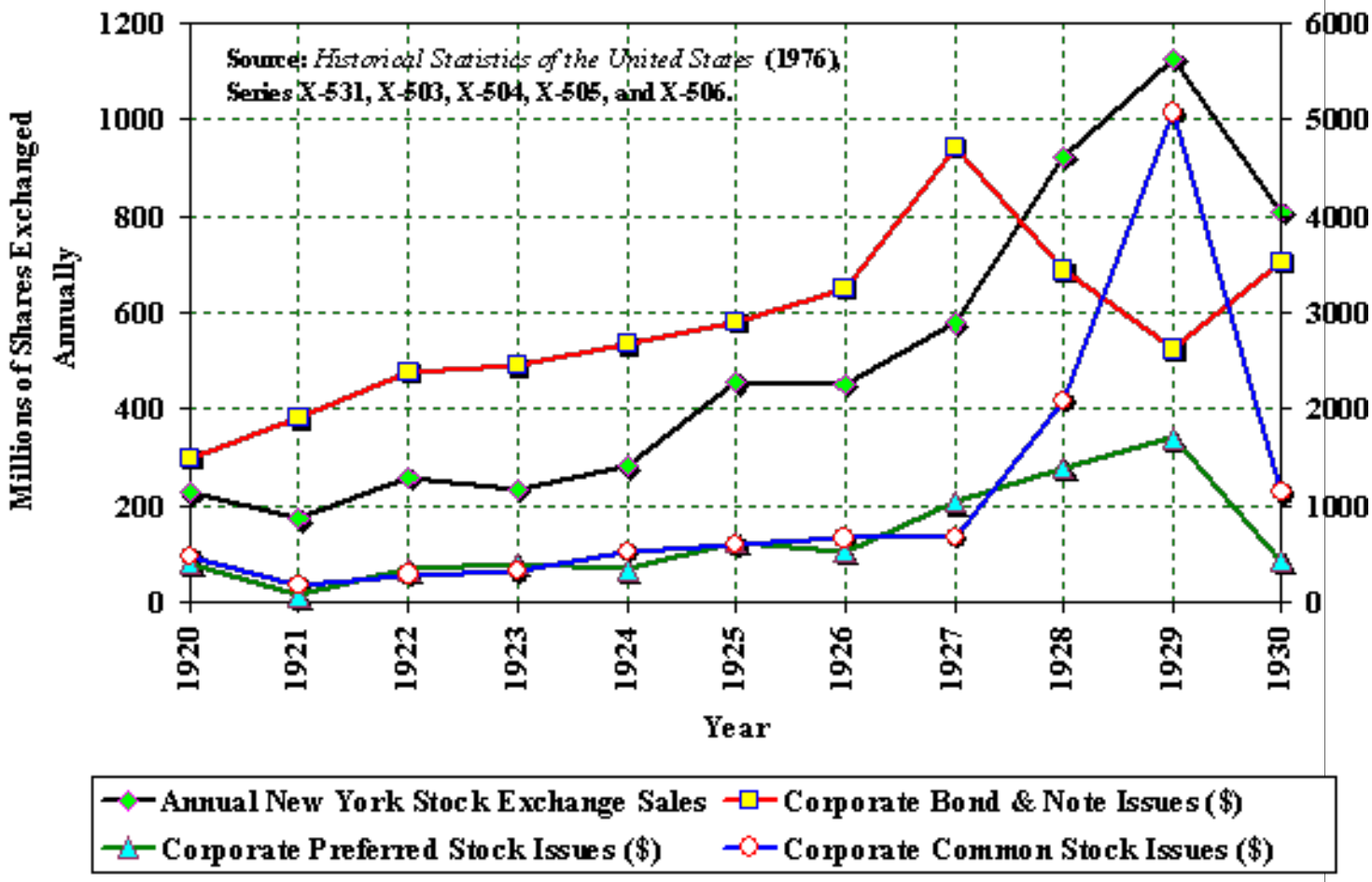


The securities market exhibited perhaps the most dramatic growth of the noncommercial bank financial intermediaries during the twenties, but others also grew rapidly. (Figure 23) The assets of life insurance companies increased by 10 percent a year from 1921 to 1929; by the late twenties they were a very important source of funds for construction investment. Mutual savings banks and savings and loan associations (thrifts) operated in essentially the same types of markets. The Mutual savings banks were concentrated in the northeastern United States. As incomes rose, personal savings increased, and housing construction expanded in the twenties, there was an increasing demand for the thrifts' interest earning time deposits and mortgage lending.

But the dramatic expansion in the financial sector came in new corporate securities issues in the twenties —especially common and preferred stock—and in the trading of existing shares of those securities. (Figure 24) The late twenties boom in the American economy was rapid, highly visible, and dramatic. Skyscrapers were being erected in most major cities, the automobile manufacturers produced over four and a half million new cars in 1929; and the stock market, like a barometer of this prosperity, was on a dizzying ride to higher and higher prices. "Playing the market" seemed to become a national pastime.

The Dow-Jones index hit its peak of 381 on September 3 and then slid to 320 on October 21. In the following week the stock market "crashed," with a record number of shares being traded on several days. At the end of Tuesday, October, 29th, the index stood at 230, 96 points less than one week before. On November 13, 1929, the Dow-Jones index reached its lowest point for the year at 198—183 points less than the September 3 peak.

Figure 24: New York Stock Exchange Sales and Securities Issued



The path of the stock market boom of the twenties can be seen in Figure 25. Sharp price breaks occurred several times during the boom, and each of these gave rise to dark predictions of the end of the bull market and speculation. Until late October of 1929, these predictions turned out to be wrong. Between those price breaks and prior to the October crash, stock prices continued to surge upward. In March of 1928, 3,875,910 shares were traded in one day, establishing a record. By late 1928, five million shares being traded in a day was a common occurrence.

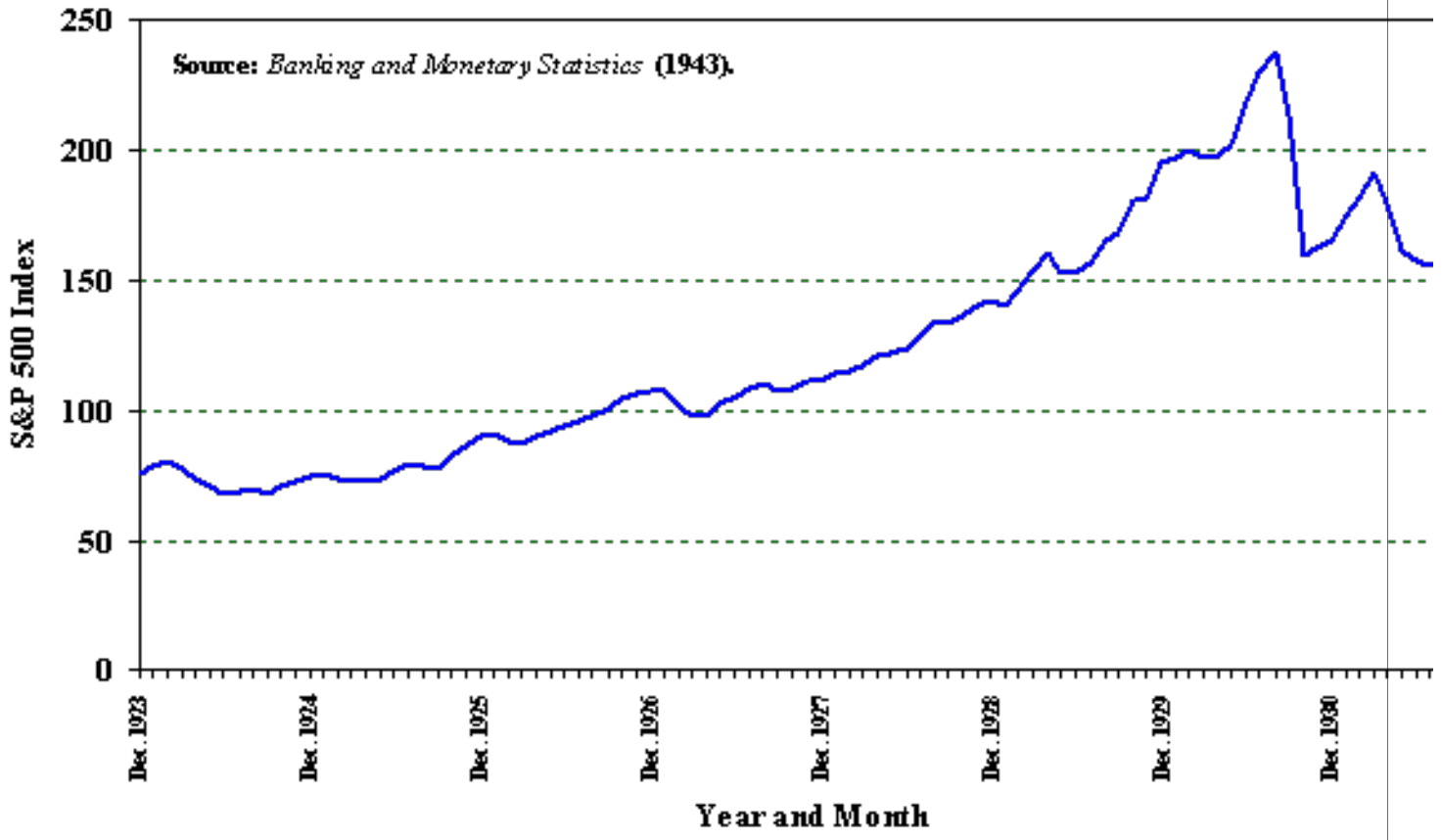
New securities, from rising merger activity and the formation of holding companies, were issued to take advantage of the rising stock prices.—Stock pools, which were not illegal until the 1934 Securities and Exchange Act, took advantage of the boom to temporarily drive up the price of selected stocks and reap large gains for the members of the pool. In stock pools a group of speculators would pool large amounts of their funds and then begin purchasing large amounts of shares of a stock. This increased demand led to rising prices for that stock. Frequently pool insiders would "churn" the stock by repeatedly buying and selling the same shares among themselves, but at rising prices. Outsiders, seeing the price rising, would decide to purchase the stock whose price was rising. At a predetermined higher price the pool members would, within a short period, sell their shares and pull out of the market for that stock. Without the additional demand from the pool, the stock's price usually fell quickly bringing large losses for the unsuspecting outside investors while reaping large gains for the pool insiders.

Another factor commonly used to explain both the speculative boom and the October crash was the purchase of stocks on small margins. However, contrary to popular perception, margin requirements through most of the twenties were essentially the same as in previous decades. Brokers, recognizing the problems with margin lending in the rapidly changing market, began raising margin requirements in late

1928, and by the fall of 1929, margin requirements were the highest in the history of the New York Stock Exchange. In the 1920s, as was the case for decades prior to that, the usual margin requirements were 10 to 15 percent of the purchase price, and, apparently, more often around 10 percent. There were increases in this percentage by 1928 and by the fall of 1928, well before the crash and at the urging of a special New York Clearinghouse committee, margin requirements had been raised to some of the highest levels in New York Stock Exchange history. One brokerage house required the following of its clients. Securities with a selling price below $10 could only be purchased for cash. Securities with a selling price of $10 to $20 had to have a 50 percent margin; for securities of $20 to $30 a margin requirement of 40 percent; and, for securities with a price above $30 the margin was 30 percent of the purchase price. In the first half of 1929 margin requirements on customers' accounts averaged a 40 percent margin, and some houses raised their margins to 50 percent a few months before the crash. These were, historically, very high margin requirements. (Smiley and Keehn, 1988)—Even so, during the crash when additional margin calls were issued, those investors who could not provide additional margin saw the brokers' sell their stock at whatever the market price was at the time and these forced sales helped drive prices even lower.

The crash began on Monday, October 21, as the index of stock prices fell 3 points on the third-largest volume in the history of the New York Stock Exchange. After a slight rally on Tuesday, prices began declining on Wednesday and fell 21 points by the end of the day bringing on the third call for more margin in that week. On Black Thursday, October 24, prices initially fell sharply, but rallied somewhat in the afternoon so that the net loss was only 7 points, but the volume of thirteen million shares set a NYSE record. Friday brought a small gain that was wiped out on Saturday. On Monday, October 28, the Dow Jones index fell 38 points on a volume of nine million shares—three million in the final hour of trading. Black Tuesday, October 29, brought declines in virtually every stock price. Manufacturing firms, which had been lending large sums to brokers for margin loans, had been calling in these loans and this accelerated on Monday and Tuesday. The big Wall Street banks increased their lending on call loans to offset some of this loss of loanable funds. The Dow Jones Index fell 30 points on a record volume of nearly sixteen and a half million shares exchanged. Black Thursday and Black Tuesday wiped out entire fortunes.

Figure 25: Standard and Poor's Common Stock Price Index, 1920 to 1930



Though the worst was over, prices continued to decline until November 13, 1929, as brokers cleaned up their accounts and sold off the stocks of clients who could not supply additional margin. After that, prices began to slowly rise and by April of 1930 had increased 96 points from the low of November 13,— "only" 87 points less than the peak of September 3, 1929. From that point, stock prices resumed their depressing decline until the low point was reached in the summer of 1932.

—There is a long tradition that insists that the Great Bull Market of the late twenties was an orgy of speculation that bid the prices of stocks far above any sustainable or economically justifiable level creating a bubble in the stock market. John Kenneth Galbraith (1954) observed, "The collapse in the stock market in the autumn of 1929 was implicit in the speculation that went before."—But not everyone has agreed with this.

In 1930 Irving Fisher argued that the stock prices of 1928 and 1929 were based on fundamental expectations that future corporate earnings would be high.— More recently, Murray Rothbard (1963), Gerald Gunderson (1976), and Jude Wanniski (1978) have argued that stock prices were not too high prior to the crash.—Gunderson suggested that prior to 1929, stock prices were where they should have been and that when corporate profits in the summer and fall of 1929 failed to meet expectations, stock prices were written down.— Wanniski argued that political events brought on the crash. The market broke each time news arrived of advances in congressional consideration of the Hawley-Smoot tariff. However, the virtually perfect foresight that Wanniski's explanation requires is unrealistic.— Charles Kindleberger (1973) and Peter Temin (1976) examined common stock yields and price-earnings ratios and found that the relative constancy did not suggest that stock prices were bid up unrealistically high in

the late twenties.—Gary Santoni and Gerald Dwyer (1990) also failed to find evidence of a bubble in stock prices in 1928 and 1929.—Gerald Sirkin (1975) found that the implied growth rates of dividends required to justify stock prices in 1928 and 1929 were quite conservative and lower than post-Second World War dividend growth rates.

However, examination of after-the-fact common stock yields and price-earning ratios can do no more than provide some ex post justification for suggesting that there was not excessive speculation during the Great Bull Market.— Each individual investor was motivated by that person's subjective expectations of each firm's future earnings and dividends and the future prices of shares of each firm's stock. Because of this element of subjectivity, not only can we never accurately know those values, but also we can never know how they varied among individuals. The market price we observe will be the end result of all of the actions of the market participants, and the observed price may be different from the price almost all of the participants expected.

In fact, there are some indications that there were differences in 1928 and 1929. Yields on common stocks were somewhat lower in 1928 and 1929. In October of 1928, brokers generally began raising margin requirements, and by the beginning of the fall of 1929, margin requirements were, on average, the highest in the history of the New York Stock Exchange. Though the discount and commercial paper rates had moved closely with the call and time rates on brokers' loans through 1927, the rates on brokers' loans increased much more sharply in 1928 and 1929.— This pulled in funds from corporations, private investors, and foreign banks as New York City banks sharply reduced their lending. These facts suggest that brokers and New York City bankers may have come to believe that stock prices had been bid above a sustainable level by late 1928 and early 1929. White (1990) created a quarterly index of dividends for firms in the Dow-Jones index and related this to the DJI. Through 1927 the two track closely, but in 1928 and 1929 the index of stock prices grows much more rapidly than the index of dividends.

The qualitative evidence for a bubble in the stock market in 1928 and 1929 that White assembled was strengthened by the findings of J. Bradford De Long and Andre Shleifer (1991). They examined closed-end mutual funds, a type of fund where investors wishing to liquidate must sell their shares to other individual investors allowing its fundamental value to be exactly measurable.— Using evidence from these funds, De Long and Shleifer estimated that in the summer of 1929, the Standard and Poor's composite stock price index was overvalued about 30 percent due to excessive investor optimism. Rappoport and White (1993 and 1994) found other evidence that supported a bubble in the stock market in 1928 and 1929. There was a sharp divergence between the growth of stock prices and dividends; there were increasing premiums on call and time brokers' loans in 1928 and 1929; margin requirements rose; and stock market volatility rose in the wake of the 1929 stock market crash.

There are several reasons for the creation of such a bubble. First, the fundamental values of earnings and dividends become difficult to assess when there are major industrial changes, such as the rapid changes in the automobile industry, the new electric utilities, and the new radio industry.— Eugene White (1990) suggests that "While investors had every reason to expect earnings to grow, they lacked the means to evaluate easily the future path of dividends." As a result investors bid up prices as they were swept up in the ongoing stock market boom. Second, participation in the stock market widened noticeably in the twenties. The new investors were relatively unsophisticated, and they were more likely to be caught up in the euphoria of the boom and bid prices upward.— New, inexperienced commission sales personnel were hired to sell stocks and they promised glowing returns on stocks they knew little about.

These observations were strengthened by the experimental work of economist Vernon Smith. (Bishop,

1987) In a number of experiments over a three-year period using students and Tucson businessmen and businesswomen, bubbles developed as inexperienced investors valued stocks differently and engaged in price speculation. As these investors in the experiments began to realize that speculative profits were unsustainable and uncertain, their dividend expectations changed, the market crashed, and ultimately stocks began trading at their fundamental dividend values. These bubbles and crashes occurred repeatedly, leading Smith to conjecture that there are few regulatory steps that can be taken to prevent a crash.

Though the bubble of 1928 and 1929 made some downward adjustment in stock prices inevitable, as Barsky and De Long have shown, changes in fundamentals govern the overall movements. And the end of the long bull market was almost certainly governed by this. In late 1928 and early 1929 there was a striking rise in economic activity, but a decline began somewhere between May and July of that year and was clearly evident by August of 1929. By the middle of August, the rise in stock prices had slowed down as better information on the contraction was received. There were repeated statements by leading figures that stocks were "overpriced" and the Federal Reserve System sharply increased the discount rate in August 1929 was well as continuing its call for banks to reduce their margin lending. As this information was assessed, the number of speculators selling stocks increased, and the number buying decreased. With the decreased demand, stock prices began to fall, and as more accurate information on the nature and extent of the decline was received, stock prices fell more. The late October crash made the decline occur much more rapidly, and the margin purchases and consequent forced selling of many of those stocks contributed to a more severe price fall. The recovery of stock prices from November 13 into April of 1930 suggests that stock prices may have been driven somewhat too low during the crash.

There is now widespread agreement that the 1929 stock market crash did not cause the Great Depression. Instead, the initial downturn in economic activity was a primary determinant of the ending of the 1928-29 stock market bubble. The stock market crash did make the downturn become more severe beginning in November 1929. It reduced discretionary consumption spending (Romer, 1990) and created greater income uncertainty helping to bring on the contraction (Flacco and Parker, 1992). Though stock market prices reached a bottom and began to recover following November 13, 1929, the continuing decline in economic activity took its toll and by May 1930 stock prices resumed their decline and continued to fall through the summer of 1932.

Domestic Trade

In the nineteenth century, a complex array of wholesalers, jobbers, and retailers had developed, but changes in the postbellum period reduced the role of the wholesalers and jobbers and strengthened the importance of the retailers in domestic trade. (Cochran, 1977; Chandler, 1977; Marburg, 1951; Clewett, 1951) The appearance of the department store in the major cities and the rise of mail order firms in the postbellum period changed the retailing market.

Department Stores

A department store is a combination of specialty stores organized as departments within one general store. A. T. Stewart's huge 1846 dry goods store in New York City is often referred to as the first department store. (Resseguie, 1965; Sobel-Sicilia, 1986) R. H. Macy started his dry goods store in 1858 and Wanamaker's in Philadelphia opened in 1876. By the end of the nineteenth century, every city of any size had at least one major department store. (Appel, 1930; Benson, 1986; Hendrickson, 1979; Hower, 1946; Sobel, 1974) Until the late twenties, the department store field was dominated by independent

stores, though some department stores in the largest cities had opened a few suburban branches and stores in other cities. In the interwar period department stores accounted for about 8 percent of retail sales.

The department stores relied on a "one-price" policy, which Stewart is credited with beginning. In the antebellum period and into the postbellum period, it was common not to post a specific price on an item; rather, each purchaser haggled with a sales clerk over what the price would be. Stewart posted fixed prices on the various dry goods sold, and the customer could either decide to buy or not buy at the fixed price. The policy dramatically lowered transactions costs for both the retailer and the purchaser. Prices were reduced with a smaller markup over the wholesale price, and a large sales volume and a quicker turnover of the store's inventory generated profits.

Mail Order Firms

What changed the department store field in the twenties was the entrance of Sears Roebuck and Montgomery Ward, the two dominant mail order firms in the United States. (Emmet-Jeuck, 1950; Chandler, 1962, 1977) Both firms had begun in the late nineteenth century and by 1914 the younger Sears Roebuck had surpassed Montgomery Ward. Both located in Chicago due to its central location in the nation's rail network and both had benefited from the advent of Rural Free Delivery in 1896 and low cost Parcel Post Service in 1912.

In 1924 Sears hired Robert C. Wood, who was able to convince Sears Roebuck to open retail stores. Wood believed that the declining rural population and the growing urban population forecast the gradual demise of the mail order business; survival of the mail order firms required a move into retail sales. By 1925 Sears Roebuck had opened 8 retail stores, and by 1929 it had 324 stores. Montgomery Ward quickly followed suit. Rather than locating these in the central business district (CBD), Wood located many on major streets closer to the residential areas. These moves of Sears Roebuck and Montgomery Ward expanded department store retailing and provided a new type of chain store.

Chain Stores

Though chain stores grew rapidly in the first two decades of the twentieth century, they date back to the 1860s when George F. Gilman and George Huntington Hartford opened a string of New York City A&P (Atlantic and Pacific) stores exclusively to sell tea. (Beckman-Nolen, 1938; Lebhar, 1963; Bullock, 1933) Stores were opened in other regions and in 1912 their first "cash-and-carry" full-range grocery was opened. Soon they were opening 50 of these stores each week and by the 1920s A&P had 14,000 stores. They then phased out the small stores to reduce the chain to 4,000 full-range, supermarket-type stores. A&P's success led to new grocery store chains such as Kroger, Jewel Tea, and Safeway.

Prior to A&P's cash-and-carry policy, it was common for grocery stores, produce (or green) grocers, and meat markets to provide home delivery and credit, both of which were costly. As a result, retail prices were generally marked up well above the wholesale prices. In cash-and-carry stores, items were sold only for cash; no credit was extended, and no expensive home deliveries were provided. Markups on prices could be much lower because other costs were much lower. Consumers liked the lower prices and were willing to pay cash and carry their groceries, and the policy became common by the twenties.

Chains also developed in other retail product lines. In 1879 Frank W. Woolworth developed a "5 and 10 Cent Store," or dime store, and there were over 1,000 F. W. Woolworth stores by the mid-1920s. (Winkler, 1940) Other firms such as Kresge, Kress, and McCrory successfully imitated Woolworth's dime

store chain. J.C. Penney's dry goods chain store began in 1901 (Beasley, 1948), Walgreen's drug store chain began in 1909, and shoes, jewelry, cigars, and other lines of merchandise also began to be sold through chain stores.

Self-Service Policies

In 1916 Clarence Saunders, a grocer in Memphis, Tennessee, built upon the one-price policy and began offering self-service at his Piggly Wiggly store. Previously, customers handed a clerk a list or asked for the items desired, which the clerk then collected and the customer paid for. With self-service, items for sale were placed on open shelves among which the customers could walk, carrying a shopping bag or pushing a shopping cart. Each customer could then browse as he or she pleased, picking out whatever was desired. Saunders and other retailers who adopted the self-service method of retail selling found that customers often purchased more because of exposure to the array of products on the shelves; as well, self-service lowered the labor required for retail sales and therefore lowered costs.

Shopping Centers

Shopping Centers, another innovation in retailing that began in the twenties, was not destined to become a major force in retail development until after the Second World War. The ultimate cause of this innovation was the widening ownership and use of the automobile. By the 1920s, as the ownership and use of the car began expanding, population began to move out of the crowded central cities toward the more open suburbs. When General Robert Wood set Sears off on its development of urban stores, he located these not in the central business district, CBD, but as free-standing stores on major arteries away from the CBD with sufficient space for parking.

At about the same time, a few entrepreneurs began to develop shopping centers. Yehoshua Cohen (1972) says, "The owner of such a center was responsible for maintenance of the center, its parking lot, as well as other services to consumers and retailers in the center." Perhaps the earliest such shopping center was the Country Club Plaza built in 1922 by the J. C. Nichols Company in Kansas City, Missouri. Other early shopping centers appeared in Baltimore and Dallas. By the mid-1930s the concept of a planned shopping center was well known and was expected to be the means to capture the trade of the growing number of suburban consumers.

International Trade and Finance

In the twenties a gold exchange standard was developed to replace the gold standard of the prewar world. Under a gold standard, each country's currency carried a fixed exchange rate with gold, and the currency had to be backed up by gold. As a result, all countries on the gold standard had fixed exchange rates with all other countries. Adjustments to balance international trade flows were made by gold flows. If a country had a deficit in its trade balance, gold would leave the country, forcing the money stock to decline and prices to fall. Falling prices made the deficit countries' exports more attractive and imports more costly, reducing the deficit. Countries

Figure 26: Total Imports and Percent of Imports Duty Free, 1913 to 1932

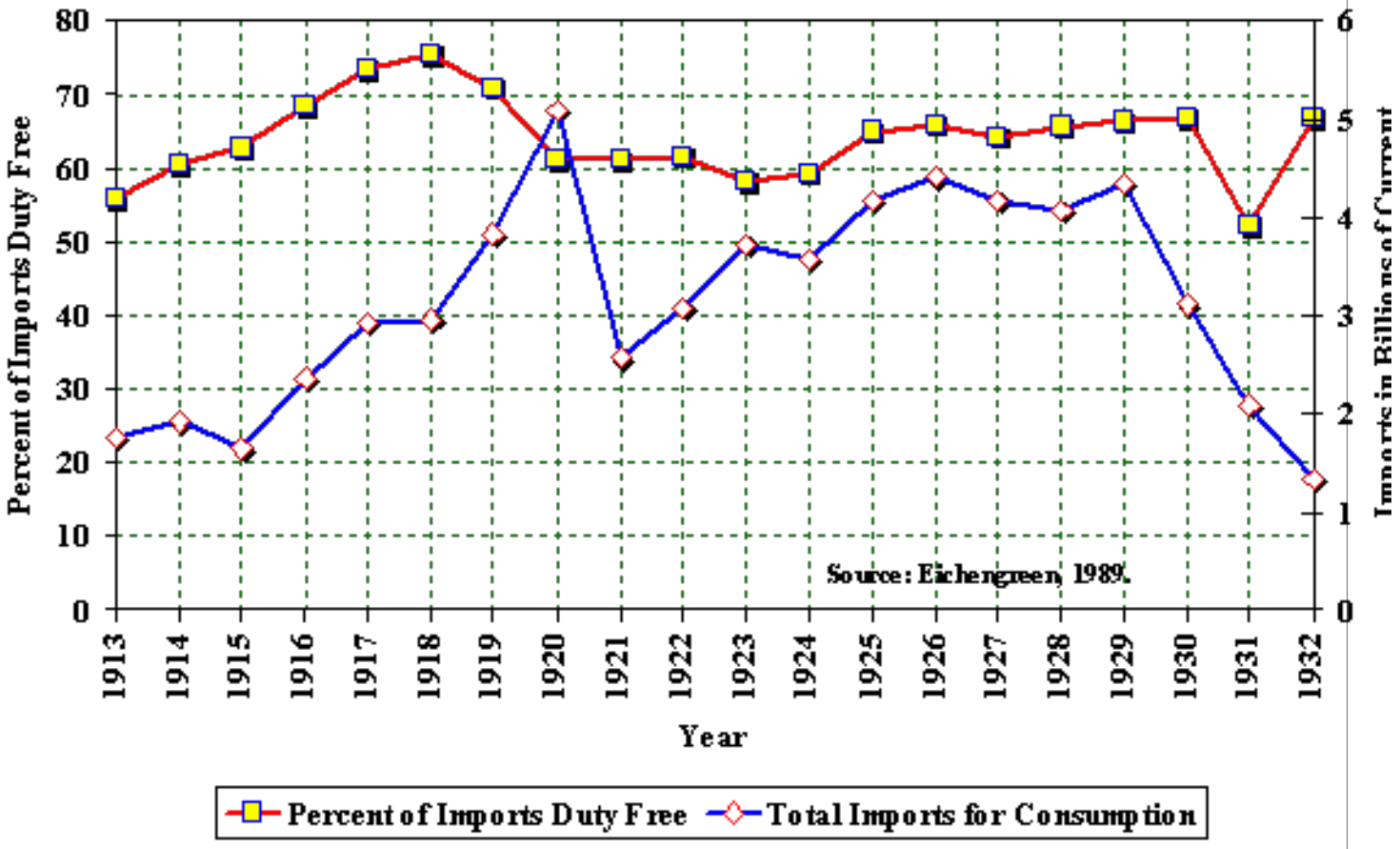
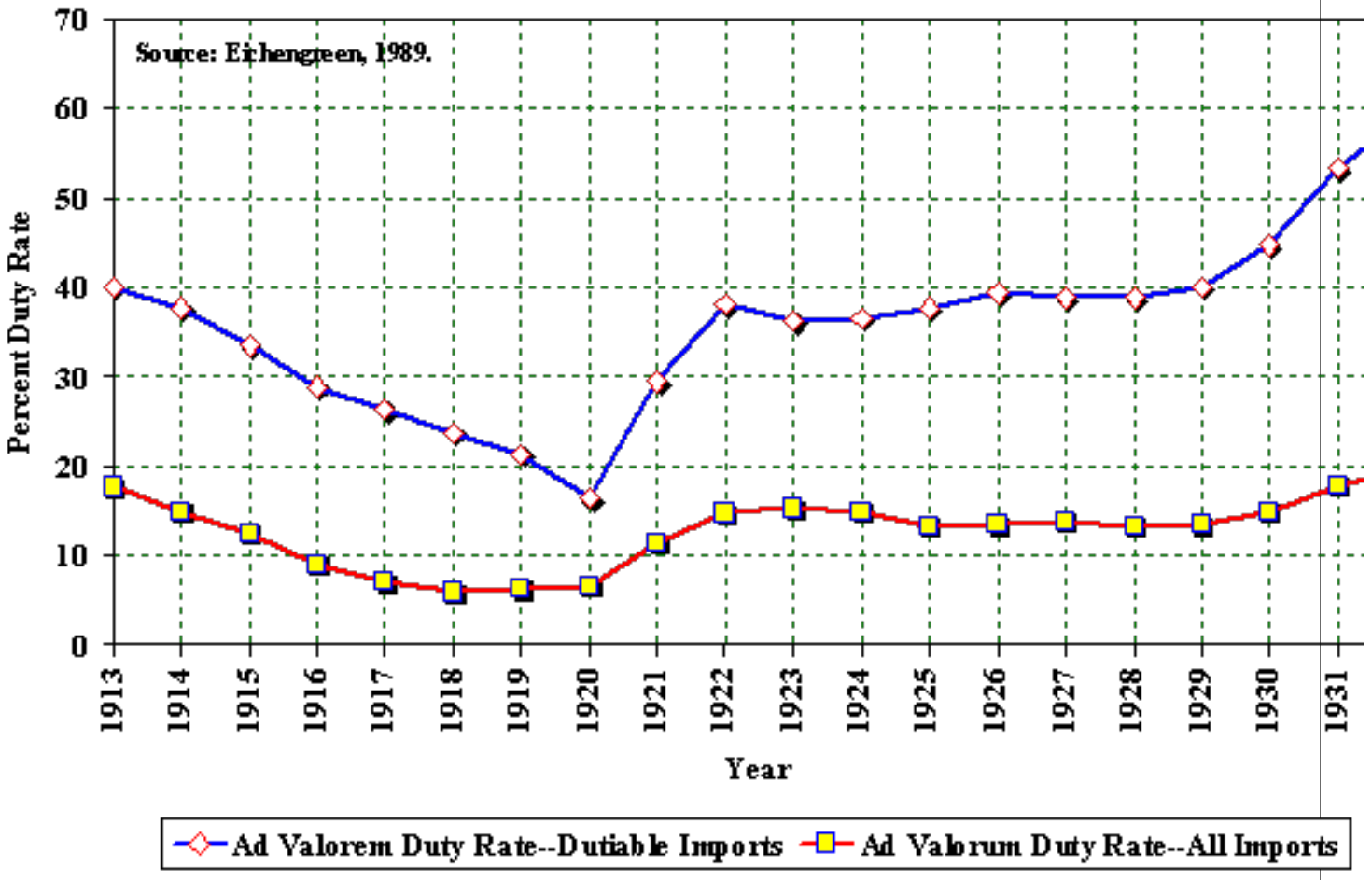


Figure 27: Ad Valorum Duty Rates on Imports



with a surplus imported gold, which increased the money stock and caused prices to rise. This made the surplus countries' exports less attractive and imports more attractive, decreasing the surplus. Most economists who have studied the prewar gold standard contend that it did not work as the conventional textbook model says, because capital flows frequently reduced or eliminated the need for gold flows for long periods of time. However, there is no consensus on whether fortuitous circumstances, rather than the gold standard, saved the international economy from periodic convulsions or whether the gold standard as it did work was sufficient to promote stability and growth in international transactions.

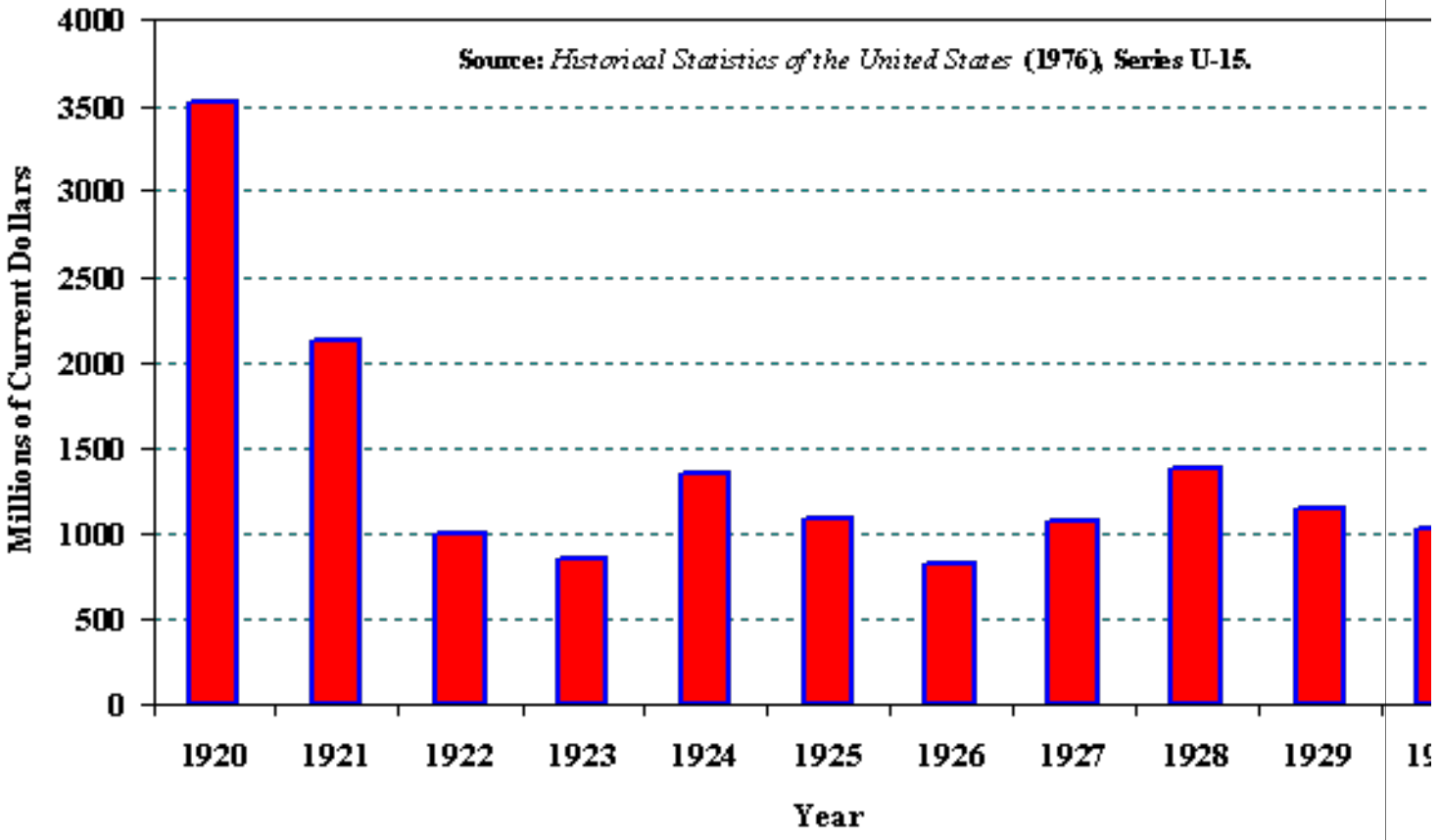
After the First World War it was argued that there was a "shortage" of fluid monetary gold to use for the gold standard, so some method of "economizing" on gold had to be found. To do this, two basic changes were made. First, most nations, other than the United States, stopped domestic circulation of gold. Second, the "gold exchange" system was created. Most countries held their international reserves in the form of U.S. dollars or British pounds and international transactions used dollars or pounds, as long as the United States and Great Britain stood ready to exchange their currencies for gold at fixed exchange rates. However, the overvaluation of the pound and the undervaluation of the franc threatened these arrangements. The British trade deficit led to a capital outflow, higher interest rates, and a weak economy. In the late twenties, the French trade surplus led to the importation of gold that they did not allow to expand the money supply.

Economizing on gold by no longer allowing its domestic circulation and by using key currencies as international monetary reserves was really an attempt to place the domestic economies under the control of the nations' politicians and make them independent of international events. Unfortunately, in doing this politicians eliminated the equilibrating mechanism of the gold standard but had nothing with which to replace it. The new international monetary arrangements of the twenties were potentially destabilizing because they were not allowed to operate as a price mechanism promoting equilibrating adjustments.

There were other problems with international economic activity in the twenties. Because of the war, the United States was abruptly transformed from a debtor to a creditor on international accounts. Though the United States did not want reparations payments from Germany, it did insist that Allied governments repay American loans. The Allied governments then insisted on war reparations from Germany. These initial reparations assessments were quite large. The Allied Reparations Commission collected the charges by supervising Germany's foreign trade and by internal controls on the German economy, and it was authorized to increase the reparations if it was felt that Germany could pay more. The treaty allowed France to occupy the Ruhr after Germany defaulted in 1923.

Ultimately, this tangled web of debts and reparations, which was a major factor in the course of international trade, depended upon two principal actions. First, the United States had to run an import surplus or, on net, export capital out of the United States to provide a pool of dollars overseas. Germany then had either to have an export surplus or else import American capital so as to build up dollar reserves—that is, the dollars the United States was exporting. In effect, these dollars were paid by Germany to Great Britain, France, and other countries that then shipped them back to the United States as payment on their U.S. debts. If these conditions did not occur, (and note that the "new" gold standard of the twenties had lost its flexibility because the price adjustment mechanism had been eliminated) disruption in international activity could easily occur and be transmitted to the domestic economies.

Figure 28: The United States Trade Balance on Goods and Services, 1920 to 1930



In the wake of the 1920-21 depression Congress passed the Emergency Tariff Act, which raised tariffs, particularly on manufactured goods. (Figures 26 and 27) The Fordney-McCumber Tariff of 1922 continued the Emergency Tariff of 1921, and its protection on many items was extremely high, ranging from 60 to 100 percent *ad valorem* (or as a percent of the price of the item). The increases in the Fordney-McCumber tariff were as large and sometimes larger than the more famous (or "infamous") Smoot-Hawley tariff of 1930. As farm product prices fell at the end of the decade presidential candidate Herbert Hoover proposed, as part of his platform, tariff increases and other changes to aid the farmers. In January 1929, after Hoover's election, but before he took office, a tariff bill was introduced into Congress. Special interests succeeded in gaining additional (or new) protection for most domestically produced commodities and the goal of greater protection for the farmers tended to get lost in the increased protection for multitudes of American manufactured products. In spite of widespread condemnation by economists, President Hoover signed the Smoot-Hawley Tariff in June 1930 and rates rose sharply.

Following the First World War, the U.S. government actively promoted American exports, and in each of the postwar years through 1929, the United States recorded a surplus in its balance of trade. (Figure 28) However, the surplus declined in the 1930s as both exports and imports fell sharply after 1929. From the mid-1920s on finished manufactures were the most important exports, while agricultural products dominated American imports.

The majority of the funds that allowed Germany to make its reparations payments to France and Great Britain and hence allowed those countries to pay their debts to the United States came from the net flow of capital out of the United States in the form of direct investment in real assets and investments in long-

and short-term foreign financial assets. After the devastating German hyperinflation of 1922 and 1923, the Dawes Plan reformed the German economy and currency and accelerated the U.S. capital outflow. American investors began to actively and aggressively pursue foreign investments, particularly loans (Lewis, 1938) and in the late twenties there was a marked deterioration in the quality of foreign bonds sold in the United States. (Mintz, 1951)

The system, then, worked well as long as there was a net outflow of American capital, but this did not continue. In the middle of 1928, the flow of short-term capital began to decline. In 1928 the flow of "other long-term" capital out of the United States was 752 million dollars, but in 1929 it was only 34 million dollars. Though arguments now exist as to whether the booming stock market in the United States was to blame for this, it had far-reaching effects on the international economic system and the various domestic economies.

The Start of the Depression

The United States had the majority of the world's monetary gold, about 40 percent, by 1920. In the latter part of the twenties, France also began accumulating gold as its share of the world's monetary gold rose from 9 percent in 1927 to 17 percent in 1929 and 22 percent by 1931. In 1927 the Federal Reserve System had reduced discount rates (the interest rate at which they lent reserves to member commercial banks) and engaged in open market purchases (purchasing U.S. government securities on the open market to increase the reserves of the banking system) to push down interest rates and assist Great Britain in staying on the gold standard. By early 1928 the Federal Reserve System was worried about its loss of gold due to this policy as well as the ongoing boom in the stock market. It began to raise the discount rate to stop these outflows. Gold was also entering the United States so that foreigners could obtain dollars to invest in stocks and bonds. As the United States and France accumulated more and more of the world's monetary gold, other countries' central banks took contractionary steps to stem the loss of gold. In country after country these deflationary strategies began contracting economic activity and by 1928 some countries in Europe, Asia, and South America had entered into a depression. More countries' economies began to decline in 1929, including the United States, and by 1930 a depression was in force for almost all of the world's market economies. (Temin, 1989; Eichengreen, 1992)

Monetary and Fiscal Policies in the 1920s

Fiscal Policies

As a tool to promote stability in aggregate economic activity, fiscal policy is largely a post-Second World War phenomenon. Prior to 1930 the federal government's spending and taxing decisions were largely, but not completely, based on the perceived "need" for government-provided public goods and services.

Though the fiscal policy concept had not been developed, this does not mean that during the twenties no concept of the government's role in stimulating economic activity existed. Herbert Stein (1990) points out that in the twenties Herbert Hoover and some of his contemporaries shared two ideas about the proper role of the federal government. The first was that federal spending on public works could be an important force in reducininvestment. Both concepts fit the ideas held by Hoover and others of his persuasion that the U.S. economy of the twenties was not the result of laissez-faire workings but of "deliberate social engineering."

The federal personal income tax was enacted in 1913. Though mildly progressive, its rates were low and topped out at 7 percent on taxable income in excess of $750,000. (Table 4) As the United States prepared

for war in 1916, rates were increased and reached a maximum marginal rate of 12 percent. With the

Table 4: Marginal Federal Income Tax Rates, 1915-1929.
(Percentage Rates)

Net Income	1913-15	1916	1917	1918	1919-21	1922-23	1924	1925-28
2,000	0	0	2	6	4	4	2	1.5
4,000	1	2	4	6	4	4	2	1.5
6,000	1	2	5	13	9	9	4	3
8,000	1	2	6	14	10	9	6	5
10,000	1	2	6	15	11	9	6	5
12,000	1	2	7	16	12	10	7	6
15,000	1	2	8	18	14	12	8	7
20,000	1	2	9	20	16	14	10	9
25,000	2	3	12	23	19	18	13	12
30,000	2	3	12	25	21	20	15	13
35,000	2	3	12	18	24	23	17	14
40,000	2	3	12	30	26	25	19	15
45,000	2	4	16	33	29	28	21	17
50,000	2	4	16	35	31	30	23	18
60,000	3	4	16	40	36	35	27	20
70,000	3	5	21	45	41	40	31	22
80,000	4	5	21	50	46	45	34	23
90,000	4	6	26	55	51	50	38	24
100,000	5	6	26	60	56	55	42	24
150,000	5	7	31	64	60	56	43	25
200,000	5	8	35	68	64	57	44	25
300,000	6	10	46	72	68	58	44	25
400,000	6	10	46	72	68	58	44	25
500,000	6	11	50	75	72	58	45	25
750,000	7	12	54	76	72	58	46	25
1,000,000	7	12	59	76	72	58	46	25
2,000,000	7	12	66	77	73	58	46	25

Source: Smiley and Keehn, 1995.

onset of the First World War, the rates were dramatically increased. To obtain additional revenue in 1918, marginal rates were again increased. The share of federal revenue generated by income taxes rose from 11 percent in 1914 to 69 percent in 1920. The tax rates had been extended downward so that more than 30 percent of the nation's income recipients were subject to income taxes by 1918. However, through the purchase of tax exempt state and local securities and through steps taken by corporations to avoid the cash distribution of profits, the number of high income taxpayers and their share of total taxes paid declined as Congress kept increasing the tax rates. The normal (or base) tax rate was reduced slightly for 1919 but the surtax rates, which made the income tax highly progressive, were retained. (Smiley-Keehn, 1995)

President Harding's new Secretary of the Treasury, Andrew Mellon, proposed cutting the tax rates, arguing that the rates in the higher brackets had "passed the point of productivity" and rates in excess of 70 percent simply could not be collected. Though most agreed that the rates were too high, there was sharp disagreement on how the rates should be cut. Democrats and Progressive Republicans argued for rate cuts targeted for the lower income taxpayers while maintaining most of the steep progressivity of the tax rates. They believed that remedies could be found to change the tax laws to stop the legal avoidance of federal income taxes. Republicans argued for sharper cuts that reduced the progressivity of the rates. Mellon proposed a maximum rate of 25 percent.

Though the federal income tax rates were reduced and made less progressive, it took three tax rate cuts in 1921, 1924, and 1925 before Mellon's goal was finally achieved. The highest marginal tax rate was

reduced from 73 percent to 58 percent to 46 percent and finally to 25 percent for the 1925 tax year. All of

Table 5: Number of Tax Returns for Net-Income Tax Classes, 1915-1929.
(Net-Income Classes in Thousands of Dollars)

Year	3-5	5-25	25-50	50-100	100-250	250-500	500-1000	1000 U
1915	127,994	180,686	17,301	6,847	2,903	592	209	12
1916	157,149	231,433	23,734	10,452	4,910	1,141	376	20
1917	560,763	383,168	30,391	12,439	5,307	901	315	14
1918	932,336	435,925	28,542	9,996	3,625	629	178	6
1919	1,180,488	601,335	37,477	13,320	4,597	675	189	6
1920	1,337,116	627,282	38,548	12,093	3,088	405	123	3
1921	1,072,146	485,591	28,946	8,718	2,022	246	63	2
1922	1,190,115	542,702	35,478	12,000	3,284	519	161	6
1923	1,723,628	569,431	39,832	12,452	3,437	530	141	7
1924	1,800,900	628,546	47,061	15,816	4,691	707	242	7
1925	1,327,683	740,431	59,721	20,958	7,445	1,429	479	20
1926	1,240,400	807,329	57,487	20,520	7,466	1,417	468	23
1927	1,209,345	819,779	60,123	22,573	8,489	1,786	557	29
1928	1,192,613	899,655	67,958	27,207	11,764	2,719	983	51
1929	1,172,655	930,033	63,689	24,073	10,732	2,595	976	51

Source: Smiley and Keehn, 1995.

Table 6: Percentage Shares of Personal Income Taxes Paid for Net-Income Classes, 1917-1929.
(Net-Income Classes in Thousands of Dollars)

Year	3-5	5-25	25-50	50-100	100-250	250-500	500-1000	1000 U
1917	4.05	18.48	11.34	12.59	18.22	10.32	8.79	16.2
1918	12.84	20.88	11.55	13.07	17.61	9.97	6.19	7.8
1919	10.15	20.19	12.20	14.68	19.57	9.40	6.00	7.8
1920	15.43	25.13	14.35	15.23	14.61	6.44	4.25	4.5
1921	12.90	27.21	15.70	16.08	14.28	5.97	3.49	4.3
1922	11.10	22.53	14.60	16.73	17.41	7.40	4.48	5.7
1923	12.21	24.01	15.61	16.41	15.70	6.82	3.84	5.3
1924	6.77	15.18	15.53	19.40	21.41	8.97	6.05	6.7
1925	1.89	12.70	16.43	20.13	21.64	10.80	7.31	9.1
1926	1.81	12.66	15.40	19.24	21.58	10.79	7.33	11.1
1927	1.41	11.42	14.38	18.86	21.91	12.40	7.74	11.8
1928	1.15	9.08	11.73	16.70	22.02	13.42	10.00	15.9
1929	0.44	6.93	11.37	16.05	21.83	13.71	10.60	19.0

Source: Smiley and Keehn, 1995.

the other rates were also reduced and exemptions increased. By 1926, only about the top 10 percent of income recipients were subject to federal income taxes. As tax rates were reduced, the number of high income tax returns increased and the share of total federal personal income taxes paid rose. (Tables 5 and 6) Even with the dramatic income tax rate cuts and reductions in the number of low income taxpayers, federal personal income tax revenue continued to rise during the 1920s. Though early estimates of the distribution of personal income showed sharp increases in income inequality during the 1920s (Kuznets, 1953; Holt, 1977), more recent estimates have found that the increases in inequality were considerably less and these appear largely to be related to the sharp rise in capital gains due to the booming stock market in the late twenties. (Smiley, 1998 and 2000)

Each year in the twenties the federal government generated a surplus, in some years as much as 1 percent of GNP. The surpluses were used to reduce the federal deficit and it declined by 25 percent between 1920 and 1930. Contrary to simple macroeconomic models that argue a federal government budget surplus must be contractionary and tend to stop an economy from reaching full employment, the American economy operated at full-employment or close to it throughout the twenties and saw significant economic growth. In this case, the surpluses were not contractionary because the dollars were circulated back into the economy through the purchase of outstanding federal debt rather than

pulled out as currency and held in a vault somewhere.

Monetary Policies

In 1913 fear of the "money trust" and their monopoly power led Congress to create 12 central banks when they created the Federal Reserve System. The new central banks were to control money and credit and act as lenders of last resort to end banking panics. The role of the Federal Reserve Board, located in Washington, D.C., was to coordinate the policies of the 12 district banks; it was composed of five presidential appointees and the current secretary of the treasury and comptroller of the currency. All national banks had to become members of the Federal Reserve System, the Fed, and any state bank meeting the qualifications could elect to do so.

The act specified fixed reserve requirements on demand and time deposits, all of which had to be on deposit in the district bank. Commercial banks were allowed to rediscount commercial paper and given Federal Reserve currency. Initially, each district bank set its own rediscount rate. To provide additional income when there was little rediscounting, the district banks were allowed to engage in open market operations that involved the purchasing and selling of federal government securities, short-term securities of state and local governments issued in anticipation of taxes, foreign exchange, and domestic bills of exchange. The district banks were also designated to act as fiscal agents for the federal government. Finally, the Federal Reserve System provided a central check clearinghouse for the entire banking system.

When the Federal Reserve System was originally set up, it was believed that its primary role was to be a lender of last resort to prevent banking panics and become a check-clearing mechanism for the nation's banks. Both the Federal Reserve Board and the Governors of the District Banks were bodies established to jointly exercise these activities. The division of functions was not clear, and a struggle for power ensued, mainly between the New York Federal Reserve Bank, which was led by J. P. Morgan's protege, Benjamin Strong, through 1928, and the Federal Reserve Board. By the thirties the Federal Reserve Board had achieved dominance.

There were really two conflicting criteria upon which monetary actions were ostensibly based: the Gold Standard and the Real Bills Doctrine. The Gold Standard was supposed to be quasi-automatic, with an effective limit to the quantity of money. However, the Real Bills Doctrine (which required that all loans be made on short-term, self-liquidating commercial paper) had no effective limit on the quantity of money. The rediscounting of eligible commercial paper was supposed to lead to the required "elasticity" of the stock of money to "accommodate" the needs of industry and business. Actually the rediscounting of commercial paper, open market purchases, and gold inflows all had the same effects on the money stock.

The 1920-21 Depression

During the First World War, the Fed kept discount rates low and granted discounts on banks' customer loans used to purchase V-bonds in order to help finance the war. The final Victory Loan had not been floated when the Armistice was signed in November of 1918: in fact, it took until October of 1919 for the government to fully sell this last loan issue. The Treasury, with the secretary of the treasury sitting on the Federal Reserve Board, persuaded the Federal Reserve System to maintain low interest rates and discount the Victory bonds necessary to keep bond prices high until this last issue had been floated. As a result, during this period the money supply grew rapidly and prices rose sharply.

A shift from a federal deficit to a surplus and supply disruptions due to steel and coal strikes in 1919 and a railroad strike in early 1920 contributed to the end of the boom. But the most—common view is that the Fed's monetary policy was the main determinant of the end of the expansion and inflation and the beginning of the subsequent contraction and severe deflation. When the Fed was released from its informal agreement with the Treasury in November of 1919, it raised the discount rate from 4 to 4.75 percent. Benjamin Strong (the governor of the New York bank) was beginning to believe that the time for strong action was past and that the Federal Reserve System's actions should be moderate. However, with Strong out of the country, the Federal Reserve Board increased the discount rate from 4.75 to 6 percent in late January of 1920 and to 7 percent on June 1, 1920. By the middle of 1920, economic activity and employment were rapidly falling, and prices had begun their downward spiral in one of the sharpest price declines in American history. The Federal Reserve System kept the discount rate at 7 percent until May 5, 1921, when it was lowered to 6.5 percent. By June of 1922, the rate had been lowered yet again to 4 percent. (Friedman and Schwartz, 1963)

The Federal Reserve System authorities received considerable criticism then and later for their actions. Milton Friedman and Anna Schwartz (1963) contend that the discount rate was raised too much too late and then kept too high for too long, causing the decline to be more severe and the price deflation to be greater. In their opinion the Fed acted in this manner due to the necessity of meeting the legal reserve requirement with a safe margin of gold reserves. Elmus Wicker (1966), however, argues that the gold reserve ratio was not the main factor determining the Federal Reserve policy in the episode. Rather, the Fed knowingly pursued a deflationary policy because it felt that the money supply was simply too large and prices too high. To return to the prewar parity for gold required lowering the price level, and there was an excessive stock of money because the additional money had been used to finance the war, not to produce consumer goods. Finally, the outstanding indebtedness was too large due to the creation of Fed credit.

Whether statutory gold reserve requirements to maintain the gold standard or domestic credit conditions were the most important determinant of Fed policy is still an open question, though both certainly had some influence. Regardless of the answer to that question, the Federal Reserve System's first major undertaking in the years immediately following the First World War demonstrated poor policy formulation.

Federal Reserve Policies from 1922 to 1930

By 1921 the district banks began to recognize that their open market purchases had effects on interest rates, the money stock, and economic activity. For the next several years, economists in the Federal Reserve System discussed how this worked and how it could be related to discounting by member banks. A committee was created to coordinate the open market purchases of the district banks.

The recovery from the 1920-1921 depression had proceeded smoothly with moderate price increases. In early 1923 the Fed sold some securities and increased the discount rate from 4 percent as they believed the recovery was too rapid. However, by the fall of 1923 there were some signs of a business slump. McMillin and Parker (1994) argue that this contraction, as well as the 1927 contraction, were related to oil price shocks. By October of 1923 Benjamin Strong was advocating securities purchases to counter this. Between then and September 1924 the Federal Reserve System increased its securities holdings by over $500 million. Between April and August of 1924 the Fed reduced the discount rate to 3 percent in a series of three separate steps. In addition to moderating the mild business slump, the expansionary policy was also intended to reduce American interest rates relative to British interest rates. This reversed the gold

flow back toward Great Britain allowing Britain to return to the gold standard in 1925. At the time it appeared that the Fed's monetary policy had successfully accomplished its goals.

By the summer of 1924 the business slump was over and the economy again began to grow rapidly. By the mid-1920s real estate speculation had arisen in many urban areas in the United States and especially in Southeastern Florida. Land prices were rising sharply. Stock market prices had also begun rising more rapidly. The Fed expressed some worry about these developments and in 1926 sold some securities to gently slow the real estate and stock market boom. Amid hurricanes and supply bottlenecks the Florida real estate boom collapsed but the stock market boom continued.

The American economy entered into another mild business recession in the fall of 1926 that lasted until the fall of 1927. One of the factors in this was Henry's Ford's shut down of all of his factories to changeover from the Model T to the Model A. His employees were left without a job and without income for over six months. International concerns also reappeared. France, which was preparing to return to the gold standard, had begun accumulating gold and gold continued to flow into the United States. Some of this gold came from Great Britain making it difficult for the British to remain on the gold standard. This occasioned a new experiment in central bank cooperation. In July 1927 Benjamin Strong arranged a conference with Governor Montagu Norman of the Bank of England, Governor Hjalmar Schacht of the Reichsbank, and Deputy Governor Charles Ritt of the Bank of France in an attempt to promote cooperation among the world's central bankers. By the time the conference began the Fed had already taken steps to counteract the business slump and reduce the gold inflow. In early 1927 the Fed reduced discount rates and made large securities purchases. One result of this was that the gold stock fell from $4.3 billion in mid-1927 to $3.8 billion in mid-1928. Some of the gold exports went to France and France returned to the gold standard with its undervalued currency. The loss of gold from Britain eased allowing it to maintain the gold standard.

By early 1928 the Fed was again becoming worried. Stock market prices were rising even faster and the apparent speculative bubble in the stock market was of some concern to Fed authorities. The Fed was also concerned about the loss of gold and wanted to bring that to an end. To do this they sold securities and, in three steps, raised the discount rate to 5 percent by July 1928. To this point the Federal Reserve Board had largely agreed with district Bank policy changes. However, problems began to develop.

During the stock market boom of the late 1920s the Federal Reserve Board preferred to use "moral suasion" rather than increases in discount rates to lessen member bank borrowing. The New York City bank insisted that moral suasion would not work unless backed up by literal credit rationing on a bank by bank basis which they, and the other district banks, were unwilling to do. They insisted that discount rates had to be increased. The Federal Reserve Board countered that this general policy change would slow down economic activity in general rather than be specifically targeted to stock market speculation. The result was that little was done for a year. Rates were not raised but no open market purchases were undertaken. Rates were finally raised to 6 percent in August of 1929. By that time the contraction had already begun. In late October the stock market crashed, and America slid into the Great Depression.

In November, following the stock market crash the Fed reduced discount rates to 4.5 percent. In January they again decreased discount rates and began a series of discount rate decreases until the rate reached 2.5 percent at the end of 1930. No further open market operations were undertaken for the next six months. As banks reduced their discounting in 1930, the stock of money declined. There was a banking crisis in the southeast in November and December of 1930, and in its wake the public's holding of currency relative to deposits and banks' reserve ratios began to rise and continued to do so through the

end of the Great Depression.

Conclusion

Though some disagree, there is growing evidence that the behavior of the American economy in the 1920s did not cause the Great Depression. The depressed 1930s were not "retribution" for the exuberant growth of the 1920s. The weakness of a few economic sectors in the 1920s did not forecast the contraction from 1929 to 1933. Rather it was the depression of the 1930s and the Second World War that interrupted the economic growth begun in the 1920s and resumed after the Second World War. Just as the construction of skyscrapers that began in the 1920s resumed in the 1950s, so did real economic growth and progress resume. In retrospect we can see that the introduction and expansion of new technologies and industries in the 1920s, such as autos, household electric appliances, radio, and electric utilities, are echoed in the 1990s in the effects of the expanding use and development of the personal computer and the rise of the internet. The 1920s have much to teach us about the growth and development of the American economy.

References

Adams, Walter, ed. *The Structure of American Industry*, 5th ed. New York: Macmillan Publishing Co., 1977.

Aldcroft, Derek H. *From Versailles to Wall Street, 1919-1929*. Berkeley: The University of California Press, 1977.

Allen, Frederick Lewis. *Only Yesterday*. New York: Harper and Sons, 1931.

Alston, Lee J. "Farm Foreclosures in the United States During the Interwar Period." *The Journal of Economic History* 43, no. 4 (1983): 885-904.

Alston, Lee J., Wayne A. Grove, and David C. Wheelock. "Why Do Banks Fail? Evidence from the 1920s." *Explorations in Economic History* 31 (1994): 409-431.

Ankli, Robert. "Horses vs. Tractors on the Corn Belt." *Agricultural History* 54 (1980): 134-148.

Ankli, Robert and Alan L. Olmstead. "The Adoption of the Gasoline Tractor in California." *Agricultural History* 55 (1981):— 213-230.

Appel, Joseph H. *The Business Biography of John Wanamaker, Founder and Builder*. New York: The Macmillan Co., 1930.

Baker, Jonathan B. "Identifying Cartel Pricing Under Uncertainty: The U.S. Steel Industry, 1933-1939." *The Journal of Law and Economics* 32 (1989): S47-S76.

Barger, E. L, et al. *Tractors and Their Power Units*. New York: John Wiley and Sons, 1952.

Barnouw, Eric. *A Tower in Babel: A History of Broadcasting in the United States: Vol. I—to 1933*. New York: Oxford University Press, 1966.

Barnouw, Eric. *The Golden Web: A History of Broadcasting in the United States: Vol. II—1933 to 1953*. New York: Oxford University Press, 1968.

Beasley, Norman. *Main Street Merchant: The Story of the J. C. Penney Company*. New York: Whittlesey House, 1948.

Beckman, Theodore N. and Herman C. Nolen. *The Chain Store Problem: A Critical Analysis*. New York: McGraw-Hill Book Co., 1938.

Benson, Susan Porter. *Counter Cultures: Saleswomen, Managers, and Customers in American Department Stores, 1890-1940*. Urbana, IL: University of Illinois Press, 1986.

Bernstein, Irving. *The Lean Years: A History of the American Worker, 1920-1933*. Boston: Houghton Mifflin Co., 1960.

Bernstein, Michael A. *The Great Depression: Delayed Recovery and Economic Change in America, 1929-1939*. New York: Cambridge University Press, 1987.

Bishop, Jerry E. "Stock Market Experiment Suggests Inevitability of Booms and Busts." *The Wall Street Journal*, 17 November, 1987.

Board of Governors of the Federal Reserve System. *Banking and Monetary Statistics*. Washington: USGOP, 1943.

Bogue, Allan G. "Changes in Mechanical and Plant Technology: The Corn Belt, 1910-1940." *The Journal of Economic History* 43 (1983): 1-26.

Breit, William and Elzinga, Kenneth. *The Antitrust Casebook: Milestones in Economic Regulation*, 2d ed. Chicago: The Dryden Press, 1989.

Bright, Arthur A., Jr. *The Electric Lamp Industry: Technological Change and Economic Development from 1800 to 1947*. New York: Macmillan, 1947.

Brody, David. *Labor in Crisis: The Steel Strike*. Philadelphia: J. B. Lippincott Co., 1965.

Brooks, John. *Telephone: The First Hundred Years*. New York: Harper and Row, 1975.

Brown, D. Clayton. *Electricity for Rural America: The Fight for the REA*. Westport, CT: The Greenwood Press, 1980.

Brown, William A., Jr. *The International Gold Standard Reinterpreted, 1914-1934*, 2 vols. New York: National Bureau of Economic Research, 1940.

Brunner, Karl and Allen Meltzer. "What Did We Learn from the Monetary Experience of the United States in the Great Depression?" *Canadian Journal of Economics* 1 (1968): 334-48.

Bryant, Keith L., Jr., and Henry C. Dethloff. *A History of American Business*. Englewood Cliffs, NJ: Prentice-Hall, Inc., 1983.

Bucklin, Louis P. *Competition and Evolution in the Distributive Trades*. Englewood Cliffs, NJ: Prentice-Hall, 1972.

Bullock, Roy J. "The Early History of the Great Atlantic & Pacific Tea Company," *Harvard Business Review* 11 (1933): 289-93.

Bullock, Roy J. "A History of the Great Atlantic & Pacific Tea Company Since 1878." *Harvard Business Review* 12 (1933): 59-69.

Cecchetti, Stephen G. "Understanding the Great Depression: Lessons for Current Policy." In *The Economics of the Great Depression*, Edited by Mark Wheeler. Kalamazoo, MI: W. E. Upjohn Institute for

Employment Research, 1998.

Chandler, Alfred D., Jr. *Strategy and Structure: Chapters in the History of the American Industrial Enterprise*. Cambridge, MA: The M.I.T. Press, 1962.

Chandler, Alfred D., Jr. *The Visible Hand: The Managerial Revolution in American Business*. Cambridge, MA: the Belknap Press Harvard University Press, 1977.

Chandler, Alfred D., Jr. *Giant Enterprise: Ford, General Motors, and the American Automobile Industry*. New York: Harcourt, Brace, and World, 1964.

Chester, Giraud, and Garnet R. Garrison. *Radio and Television: An Introduction*. New York: Appleton-Century Crofts, 1950.

Clewett, Richard C. "Mass Marketing of Consumers' Goods." In *The Growth of the American Economy,* 2d ed. Edited by Harold F. Williamson. Englewood Cliffs, NJ: Prentice-Hall, 1951.

Cochran, Thomas C. *200 Years of American Business*. New York: Delta Books, 1977.

Cohen, Yehoshua S. *Diffusion of an Innovation in an Urban System: The Spread of Planned Regional Shopping Centers in the United States, 1949-1968*. Chicago: The University of Chicago, Department of Geography, Research Paper No. 140, 1972.

Daley, Robert. *An American Saga: Juan Trippe and His Pan American Empire*. New York: Random House, 1980.

De Long, J. Bradford, and Andre Shleifer. "The Stock Market Bubble of 1929: Evidence from Closed-end Mutual Funds." *The Journal of Economic History* 51 (September 1991): 675-700.

Clarke, Sally. "New Deal Regulation and the Revolution in American Farm Productivity: A Case Study of the Diffusion of the Tractor in the Corn Belt, 1920-1940." *The Journal of Economic History* 51, no. 1 (1991): 105-115.

Cohen, Avi. "Technological Change as Historical Process: The Case of the U.S. Pulp and Paper Industry, 1915-1940." *The Journal of Economic History* 44 (1984): 775-79.

Davies, R. E. G. *A History of the World's Airlines*. London: Oxford University Press, 1964.

Dearing, Charles L., and Wilfred Owen. *National Transportation Policy*. Washington: The Brookings Institution, 1949.

Degen, Robert A. *The American Monetary System: A Concise Survey of Its Evolution Since 1896*. Lexington, MA: Lexington Books, 1987.

De Long, J. Bradford and Andre Shleifer. "The Stock Market Bubble of 1929: Evidence from Closed-end Mutual Funds." *The Journal of Economic History* 51 (1991): 675-700.

Devine, Warren D., Jr. "From Shafts to Wires: Historical Perspectives on Electrification." *The Journal of Economic History* 43 (1983): 347-372.

Eckert, Ross D., and George W. Hilton. "The Jitneys." *The Journal of Law and Economics* 15 (October 1972): 293-326.

Eichengreen, Barry, ed. *The Gold Standard in Theory and History*. New York: Metheun, 1985.

Barry Eichengreen. “The Political Economy of the Smoot-Hawley Tariff.” Research in Economic History 12 (1989): 1-43.

Eichengreen, Barry. *Golden Fetters: The Gold Standard and the Great Depression, 1919-1939*. New York: Oxford University Press, 1992.

Eis, Carl. “The 1919-1930 Merger Movement in American Industry.” *The Journal of Law and Economics* XII (1969): 267-96.

Emmet, Boris, and John E. Jeuck. *Catalogues and Counters: A History of Sears Roebuck and Company*. Chicago: University of Chicago Press, 1950.

Fearon, Peter. *War, Prosperity, & Depression: The U.S. Economy, 1947-1945*. Lawrence, KS: University of Kansas Press, 1987.

Field, Alexander J. “The Most Technologically Progressive Decade of the Century.” *The American Economic Review* 93 (2003): 1399-1413.

Fischer, Claude. “The Revolution in Rural Telephony, 1900-1920.” *Journal of Social History* 21 (1987): 221-38.

Fischer, Claude. “Technology’s Retreat: The Decline of Rural Telephony in the United States, 1920-1940.” *Social Science History*, Vol. 11 (Fall 1987), pp. 295-327.

Fisher, Irving. *The Stock Market Crash—and After*. New York: Macmillan, 1930.

French, Michael J. “Structural Change and Competition in the United States Tire Industry, 1920-1937.” *Business History Review* 60 (1986): 28-54.

French, Michael J. *The U.S. Tire Industry*. Boston: Twayne Publishers, 1991.

Fricke, Ernest B. “The New Deal and the Modernization of Small Business: The McCreary Tire and Rubber Company, 1930-1940.” *Business History Review* 56 (1982):— 559-76.

Friedman, Milton, and Anna J. Schwartz. *A Monetary History of the United States, 1867-1960. Princeton: Princeton University Press, 1963.*

Galbraith, John Kenneth. *The Great Crash*. Boston: Houghton Mifflin, 1954.

Garnet, Robert W. *The Telephone Enterprise: The Evolution of the Bell System’s Horizontal Structure, 1876-1900*. Baltimore: The Johns Hopkins University Press, 1985.

Gideonse, Max. “Foreign Trade, Investments, and Commercial Policy.” In *The Growth of the American Economy, 2d ed. Edited by Harold F. Williamson. Englewood Cliffs, NJ: Prentice-Hall, 1951.*

Giedion, Simon. *Mechanization Takes Command*. New York: Oxford University Press, 1948.

Gordon, Robert Aaron. *Economic Instability and Growth: The American Record*. New York: Harper and Row, 1974.

Gray, Roy Burton. *Development of the Agricultural Tractor in the United States*, 2 vols. Washington, D. C.: USGPO, 1954.

Gunderson, Gerald. *An Economic History of America*. New York: McGraw-Hill, 1976.

Hadwiger, Don F., and Clay Cochran. "Rural Telephones in the United States." *Agricultural History* 58 (July 1984): 221-38.

Hamilton, James D. "Monetary Factors in the Great Depression." *Journal of Monetary Economics* 19 (1987): 145-169.

Hamilton, James D. "The Role of the International Gold Standard in Propagating the Great Depression." *Contemporary Policy Issues* 6 (1988): 67-89.

Hayek, Friedrich A. *Prices and Production*. New York: Augustus M. Kelly reprint of 1931 edition.

Hayford, Marc and Carl A. Pasurka, Jr. "The Political Economy of the Fordney-McCumber and Smoot-Hawley Tariff Acts." *Explorations in Economic History* 29 (1992): 30-50.

Hendrickson, Robert. *The Grand Emporiums: The Illustrated History of America's Great Department Stores*. Briarcliff Manor, NY: Stein and Day, 1979.

Herbst, Anthony F., and Joseph S. K. Wu. "Some Evidence of Subsidization of the U.S. Trucking Industry, 1900-1920." *The Journal of Economic History— 33 (June 1973): 417-33.*

Higgs, Robert. *Crisis and Leviathan: Critical Episodes in the Growth of American Government*. New York: Oxford University Press, 1987.

Hilton, George W., and John Due. *The Electric Interurban Railways in America*. Stanford: Stanford University Press, 1960.

Hoffman, Elizabeth and Gary D. Liebcap. "Institutional Choice and the Development of U.S. Agricultural Policies in the 1920s." *The Journal of Economic History* 51 (1991): 397-412.

Holt, Charles F. "Who Benefited from the Prosperity of the Twenties?" *Explorations in Economic History* 14 (1977): 277-289.

Hower, Ralph W. *History of Macy's of New York, 1858-1919*. Cambridge, MA: Harvard University Press, 1946.

Hubbard, R. Glenn, Ed. *Financial Markets and Financial Crises*. Chicago: University of Chicago Press, 1991.

Hunter, Louis C. "Industry in the Twentieth Century." In *The Growth of the American Economy*, 2d ed., edited by Harold F. Williamson. Englewood Cliffs, NJ: Prentice-Hall, 1951.

Jerome, Harry. *Mechanization in Industry*. New York: National Bureau of Economic Research, 1934.

Johnson, H. Thomas. "Postwar Optimism and the Rural Financial Crisis." *Explorations in Economic History* 11, no. 2 (1973-1974): 173-192.

Jones, Fred R. and William H. Aldred. *Farm Power and Tractors*, 5th ed. New York: McGraw-Hill, 1979.

Keller, Robert. "Factor Income Distribution in the United States During the 20's: A Reexamination of Fact and Theory." *The Journal of Economic History* 33 (1973): 252-95.

Kelly, Charles J., Jr. *The Sky's the Limit: The History of the Airlines*. New York: Coward-McCann, 1963.

Kindleberger, Charles. *The World in Depression, 1929-1939*. Berkeley: The University of California Press, 1973.

Klebaner, Benjamin J. *Commercial Banking in the United States: A History*. New York: W. W. Norton and Co., 1974.

Kuznets, Simon. *Shares of Upper Income Groups in Income and Savings*. New York: NBER, 1953.

Lebhar, Godfrey M. *Chain Stores in America, 1859-1962*. New York: Chain Store Publishing Corp., 1963.

Lewis, Cleona. *America's Stake in International Investments*. Washington: The Brookings Institution, 1938.

Livesay, Harold C. and Patrick G. Porter. "Vertical Integration in American Manufacturing, 1899-1948." *The Journal of Economic History* 29 (1969): 494-500.

Lipartito, Kenneth. *The Bell System and Regional Business: The Telephone in the South, 1877-1920*. Baltimore: The Johns Hopkins University Press, 1989.

Liu, Tung, Gary J. Santoni, and Courteney C. Stone. "In Search of Stock Market Bubbles: A Comment on Rappoport and White." *The Journal of Economic History* 55 (1995): 647-654.

Lorant, John. "Technological Change in American Manufacturing During the 1920s." *The Journal of Economic History* 33 (1967): 243-47.

MacDonald, Forrest. *Insull*. Chicago: University of Chicago Press, 1962.

Marburg, Theodore. "Domestic Trade and Marketing." In *The Growth of the American Economy,* 2d ed. Edited by Harold F. Williamson. Englewood Cliffs, NJ: Prentice-Hall, 1951.

Markham, Jesse. "Survey of the Evidence and Findings on Mergers." In *Business Concentration and Price Policy, National Bureau of Economic Research. Princeton: Princeton University Press, 1955.*

Markin, Rom J. *The Supermarket: An Analysis of Growth, Development, and Change*. Rev. ed. Pullman, WA: Washington State University Press, 1968.

McCraw, Thomas K. *TVA and the Power Fight, 1933-1937*. Philadelphia: J. B. Lippincott, 1971.

McCraw, Thomas K. and Forest Reinhardt. "Losing to Win: U.S. Steel's Pricing, Investment Decisions, and Market Share, 1901-1938." *The Journal of Economic History* 49 (1989): 592-620.

McMillin, W. Douglas and Randall E. Parker. "An Empirical Analysis of Oil Price Shocks in the Interwar Period." *Economic Inquiry* 32 (1994): 486-497.

McNair, Malcolm P., and Eleanor G. May. *The Evolution of Retail Institutions in the United States*. Cambridge, MA: The Marketing Science Institute, 1976.

Mercer, Lloyd J. "Comment on Papers by Scheiber, Keller, and Raup." *The Journal of Economic History 33 (1973): 291-95.*

Mintz, Ilse. *Deterioration in the Quality of Foreign Bonds Issued in the United States, 1920-1930*. New York: National Bureau of Economic Research, 1951.

Mishkin, Frederic S. "Asymmetric Information and Financial Crises: A Historical Perspective." In *Financial Markets and Financial Crises* Edited by R. Glenn Hubbard. Chicago: University of Chicago Press, 1991.

Morris, Lloyd. *Not So Long Ago*. New York: Random House, 1949.

Mosco, Vincent. *Broadcasting in the United States: Innovative Challenge and Organizational Control*. Norwood, NJ: Ablex Publishing Corp., 1979.

Moulton, Harold G. et al. *The American Transportation Problem*. Washington: The Brookings Institution, 1933.

Mueller, John. "Lessons of the Tax-Cuts of Yesteryear." *The Wall Street Journal*, March 5, 1981.

Musoke, Moses S. "Mechanizing Cotton Production in the American South: The Tractor, 1915-1960." *Explorations in Economic History* 18 (1981): 347-75.

Nelson, Daniel. "Mass Production and the U.S. Tire Industry." *The Journal of Economic History 48 (1987): 329-40.*

Nelson, Ralph L. *Merger Movements in American Industry, 1895-1956*. Princeton: Princeton University Press, 1959.

Niemi, Albert W., Jr., *U.S. Economic History*, 2nd ed. Chicago: Rand McNally Publishing Co., 1980.

Norton, Hugh S. *Modern Transportation Economics*. Columbus, OH: Charles E. Merrill Books, Inc., 1963.

Nystrom, Paul H. *Economics of Retailing*, vol. 1, 3rd ed. New York: The Ronald Press Co., 1930.

Oshima, Harry T. "The Growth of U.S. Factor Productivity: The Significance of New Technologies in the Early Decades of the Twentieth Century." *The Journal of Economic History 44 (1984): 161-70.*

Parker, Randall and W. Douglas McMillin. "An Empirical Analysis of Oil Price Shocks During the Interwar Period." *Economic Inquiry* 32 (1994): 486-497.

Parker, Randall and Paul Flacco. "Income Uncertainty and the Onset of the Great Depression." *Economic Inquiry* 30 (1992): 154-171.

Parker, William N. "Agriculture." In *American Economic Growth: An Economist's History of the United States*, edited by Lance E. Davis, Richard A. Easterlin, William N. Parker, et. al. New York: Harper and Row, 1972.

Passer, Harold C. *The Electrical Manufacturers, 1875-1900*. Cambridge: Harvard University Press, 1953.

Peak, Hugh S., and Ellen F. Peak. *Supermarket Merchandising and Management*. Englewood Cliffs, NJ: Prentice-Hall, 1977.

Pilgrim, John. "The Upper Turning Point of 1920: A Reappraisal." *Explorations in Economic History 11 (1974): 271-98.*

Rae, John B. *Climb to Greatness: The American Aircraft Industry, 1920-1960*. Cambridge: The M.I.T. Press, 1968.

Rae, John B. *The American Automobile Industry*. Boston: Twayne Publishers, 1984.

Rappoport, Peter and Eugene N. White. "Was the Crash of 1929 Expected?" *American Economic Review* 84 (1994): 271-281.

Rappoport, Peter and Eugene N. White. "Was There a Bubble in the 1929 Stock Market?" *The Journal of*

Economic History 53 (1993): 549-574.

Resseguie, Harry E. "Alexander Turney Stewart and the Development of the Department Store, 1823-1876," *Business History Review* 39 (1965): 301-22.

Rezneck, Samuel. "Mass Production and the Use of Energy." In *The Growth of the American Economy*, 2d ed., edited by Harold F. Williamson. Englewood Cliffs, NJ: Prentice-Hall, 1951.

Rockwell, Llewellyn H., Jr., ed. *The Gold Standard: An Austrian Perspective*. Lexington, MA: Lexington Books, 1985.

Romer, Christina. "Spurious Volatility in Historical Unemployment Data." *The Journal of Political Economy* 91 (1986): 1-37.

Romer, Christina. "New Estimates of Prewar Gross National Product and Unemployment." *Journal of Economic History* 46 (1986): 341-352.

Romer, Christina. "World War I and the Postwar Depression: A Reinterpretation Based on Alternative Estimates of GNP." *Journal of Monetary Economics* 22 (1988): 91-115.

Romer, Christina and Jeffrey A. Miron. "A New Monthly Index of Industrial Production, 1884-1940." *Journal of Economic History* 50 (1990): 321-337.

Romer, Christina. "The Great Crash and the Onset of the Great Depression." *Quarterly Journal of Economics* 105 (1990): 597-625.

Romer, Christina. "Remeasuring Business Cycles." *The Journal of Economic History* 54 (1994): 573-609.

Roose, Kenneth D. "The Production Ceiling and the Turning Point of 1920." *American Economic Review* 48 (1958): 348-56.

Rosen, Philip T. *The Modern Stentors: Radio Broadcasters and the Federal Government, 1920-1934*. Westport, CT: The Greenwood Press, 1980.

Rosen, Philip T. "Government, Business, and Technology in the 1920s: The Emergence of American Broadcasting." In *American Business History: Case Studies*. Edited by Henry C. Dethloff and C. Joseph Pusateri. Arlington Heights, IL: Harlan Davidson, 1987.

Rothbard, Murray N. *America's Great Depression*. Kansas City: Sheed and Ward, 1963.

Sampson, Roy J., and Martin T. Ferris. *Domestic Transportation: Practice, Theory, and Policy*, 4th ed. Boston: Houghton Mifflin Co., 1979.

Samuelson, Paul and Everett E. Hagen. *After the War—1918-1920*. Washington: National Resources Planning Board, 1943.

Santoni, Gary and Gerald P. Dwyer, Jr. "The Great Bull Markets, 1924-1929 and 1982-1987: Speculative Bubbles or Economic Fundamentals?" *Federal Reserve Bank of St. Louis Review* 69 (1987): 16-29.

Santoni, Gary, and Gerald P. Dwyer, Jr. "Bubbles vs. Fundamentals: New Evidence from the Great Bull Markets." In *Crises and Panics: The Lessons of History*. Edited by Eugene N. White. Homewood, IL: Dow Jones/Irwin, 1990.

Scherer, Frederick M. and David Ross. *Industrial Market Structure and Economic Performance*, 3d ed.

Boston: Houghton Mifflin, 1990.

Schlebecker, John T. *Whereby We Thrive: A History of American Farming, 1607-1972*. Ames, IA: The Iowa State University Press, 1975.

Shepherd, James. "The Development of New Wheat Varieties in the Pacific Northwest." *Agricultural History* 54 (1980): 52-63.

Sirkin, Gerald. "The Stock Market of 1929 Revisited: A Note." *Business History Review* 49 (Fall 1975): 233-41.

Smiley, Gene. *The American Economy in the Twentieth Century*. Cincinnati: South-Western Publishing Co., 1994.

Smiley, Gene. "New Estimates of Income Shares During the 1920s." In *Calvin Coolidge and the Coolidge Era: Essays on the History of the 1920s*, edited by John Earl Haynes, 215-232. Washington, D.C.: Library of Congress, 1998.

Smiley, Gene. "A Note on New Estimates of the Distribution of Income in the 1920s." *The Journal of Economic History* 60, no. 4 (2000): 1120-1128.

Smiley, Gene. *Rethinking the Great Depression: A New View of Its Causes and Consequences*. Chicago: Ivan R. Dee, 2002.

Smiley, Gene, and Richard H. Keehn. "Margin Purchases, Brokers' Loans and the Bull Market of the Twenties." *Business and Economic History*. 2d series. 17 (1988): 129-42.

Smiley, Gene and Richard H. Keehn. "Federal Personal Income Tax Policy in the 1920s." *the Journal of Economic History* 55, no. 2 (1995): 285-303.

Sobel, Robert. *The Entrepreneuers: Explorations Within the American Business Tradition*. New York: Weybright and Talley, 1974.

Soule, George. *Prosperity Decade: From War to Depression: 1917-1929*. New York: Holt, Rinehart, and Winston, 1947.

Stein, Herbert. *The Fiscal Revolution in America*, revised ed. Washington, D.C.: AEI Press, 1990.

Stigler, George J. "Monopoly and Oligopoly by Merger." *American Economic Review*, 40 (May 1950): 23-34.

Sumner, Scott. "The Role of the International Gold Standard in Commodity Price Deflation: Evidence from the 1929 Stock Market Crash." *Explorations in Economic History* 29 (1992): 290-317.

Swanson, Joseph and Samuel Williamson. "Estimates of National Product and Income for the United States Economy, 1919-1941." *Explorations in Economic History* 10, no. 1 (1972): 53-73.

Temin, Peter. "The Beginning of the Depression in Germany." *Economic History Review*. 24 (May 1971): 240-48.

Temin, Peter. *Did Monetary Forces Cause the Great Depression*. New York: W. W. Norton, 1976.

Temin, Peter. *The Fall of the Bell System*. New York: Cambridge University Press, 1987.

Temin, Peter. *Lessons from the Great Depression*. Cambridge, MA: The M.I.T. Press, 1989.

Thomas, Gordon, and Max Morgan-Witts. *The Day the Bubble Burst*. Garden City, NY: Doubleday, 1979.

Ulman, Lloyd. "The Development of Trades and Labor Unions," In *American Economic History*, edited by Seymour E. Harris, chapter 14. New York: McGraw-Hill Book Co., 1961.

Ulman Lloyd. *The Rise of the National Trade Union*. Cambridge, MA: Harvard University Press, 1955.

U.S. Department of Commerce, Bureau of the Census. *Historical Statistics of the United States: Colonial Times to 1970*, 2 volumes. Washington, D.C.: USGPO, 1976.

Walsh, Margaret. *Making Connections: The Long Distance Bus Industry in the U.S.A.* Burlington, VT: Ashgate, 2000.

Wanniski, Jude. *The Way the World Works*. New York: Simon and Schuster, 1978.

Weiss, Leonard W. *Cast Studies in American Industry*, 3d ed. New York: John Wiley & Sons, 1980.

Whaples, Robert. "Hours of Work in U.S. History." EH.Net Encyclopedia, edited by Robert Whaples, August 15 2001 URL— http://www.eh.net/encyclopedia/contents/whaples.work.hours.us.php

Whatley, Warren. "Southern Agrarian Labor Contracts as Impediments to Cotton Mechanization." *The Journal of Economic History* 87 (1987): 45-70.

Wheelock, David C. and Subal C. Kumbhakar. "The Slack Banker Dances: Deposit Insurance and Risk-Taking in the Banking Collapse of the 1920s." *Explorations in Economic History* 31 (1994): 357-375.

White, Eugene N. "The Stock Market Boom and Crash of 1929 Revisited." *The Journal of Economic Perspectives*. 4 (Spring 1990): 67-83.

White, Eugene N., Ed. *Crises and Panics: The Lessons of History*. Homewood, IL: Dow Jones/Irwin, 1990.

White, Eugene N. "When the Ticker Ran Late: The Stock Market Boom and Crash of 1929." In *Crises and Panics: The Lessons of History* Edited by Eugene N. White. Homewood, IL: Dow Jones/Irwin, 1990.

White, Eugene N. "Stock Market Bubbles? A Reply." *The Journal of Economic History* 55 (1995): 655-665.

White, William J. "Economic History of Tractors in the United States." EH.Net Encyclopedia, edited by Robert Whaples, August 15 2001 URL
http://www.eh.net/encyclopedia/contents/white.tractors.history.us.php

Wicker, Elmus. "Federal Reserve Monetary Policy, 1922-1933: A Reinterpretation." *Journal of Political Economy* 73 (1965): 325-43.

Wicker, Elmus. "A Reconsideration of Federal Reserve Policy During the 1920-1921 Depression." *The Journal of Economic History* 26 (1966): 223-38.

Wicker, Elmus. *Federal Reserve Monetary Policy, 1917-1933*. New York: Random House, 1966.

Wigmore, Barrie A. *The Crash and Its Aftermath*. Westport, CT: Greenwood Press, 1985.

Williams, Raburn McFetridge. *The Politics of Boom and Bust in Twentieth-Century America*. Minneapolis/St. Paul: West Publishing Co., 1994.

Williamson, Harold F., et al. *The American Petroleum Industry: The Age of Energy, 1899-1959*. Evanston,

IL: Northwestern University Press, 1963.

Wilson, Thomas. *Fluctuations in Income and Employment*, 3d ed. New York: Pitman Publishing, 1948.

Wilson, Jack W., Richard E. Sylla, and Charles P. Jones. "Financial Market Panics and Volatility in the Long Run, 1830-1988." In *Crises and Panics: The Lessons of History* Edited by Eugene N. White. Homewood, IL: Dow Jones/Irwin, 1990.

Winkler, John Kennedy. *Five and Ten: The Fabulous Life of F. W. Woolworth*. New York: R. M. McBride and Co., 1940.

Wood, Charles. "Science and Politics in the War on Cattle Diseases: The Kansas Experience, 1900-1940." *Agricultural History* 54 (1980): 82-92.

Wright, Gavin. *Old South, New South: Revolutions in the Southern Economy Since the Civil War*. New York: Basic Books, 1986.

Wright, Gavin. "The Origins of American Industrial Success, 1879-1940." *The American Economic Review* 80 (1990): 651-668.

Citation: Smiley, Gene. "US Economy in the 1920s". EH.Net Encyclopedia, edited by Robert Whaples. June 29, 2004. URL http://eh.net/encyclopedia/the-u-s-economy-in-the-1920s/

The Depression of 1893

David O. Whitten, Auburn University

The Depression of 1893 was one of the worst in American history with the unemployment rate exceeding ten percent for half a decade. This article describes economic developments in the decades leading up to the depression; the performance of the economy during the 1890s; domestic and international causes of the depression; and political and social responses to the depression.

The Depression of 1893 can be seen as a watershed event in American history. It was accompanied by violent strikes, the climax of the Populist and free silver political crusades, the creation of a new political balance, the continuing transformation of the country's economy, major changes in national policy, and far-reaching social and intellectual developments. Business contraction shaped the decade that ushered out the nineteenth century.

Unemployment Estimates

One way to measure the severity of the depression is to examine the unemployment rate. Table 1 provides estimates of unemployment, which are derived from data on output — annual unemployment was not directly measured until 1929, so there is no consensus on the precise magnitude of the unemployment rate of the 1890s. Despite the differences in the two series, however, it is obvious that the Depression of 1893 was an important event. The unemployment rate exceeded ten percent for five or six consecutive years. The only other time this occurred in the history of the US economy was during the Great Depression of the 1930s.

Timing and Depth of the Depression

The National Bureau of Economic Research estimates that the economic contraction began in January 1893 and continued until June 1894. The economy then grew until December 1895, but it was then hit by a second recession that lasted until June 1897. Estimates of annual real gross national product (which adjust for this period's deflation) are fairly crude, but they generally suggest that real GNP fell about 4% from 1892 to 1893 and another 6% from 1893 to 1894. By 1895 the economy had grown past its earlier peak, but GDP fell about 2.5% from 1895 to 1896. During this period population grew at about 2% per year, so real GNP per person didn't surpass its 1892 level until 1899. Immigration, which had averaged over 500,000 people per year in the 1880s and which would surpass one million people per year in the first decade of the 1900s, averaged only 270,000 from 1894 to 1898.

Table 1
Estimates of Unemployment during the 1890s

Year	Lebergott	Romer
1890	4.0%	4.0%
1891	5.4	4.8
1892	3.0	3.7
1893	11.7	8.1
1894	18.4	12.3
1895	13.7	11.1
1896	14.5	12.0
1897	14.5	12.4
1898	12.4	11.6
1899	6.5	8,7
1900	5.0	5.0

Source: Romer, 1984

The depression struck an economy that was more like the economy of 1993 than that of 1793. By 1890, the US economy generated one of the highest levels of output per person in the world — below that in Britain, but higher than the rest of Europe. Agriculture no longer dominated the economy, producing only about 19 percent of GNP, well below the 30 percent produced in manufacturing and mining. Agriculture's share of the labor force, which had been about 74% in 1800, and 60% in 1860, had fallen to roughly 40% in 1890. As Table 2 shows, only the South remained a predominantly agricultural region. Throughout the country few families were self-sufficient, most relied on selling their output or labor in the market — unlike those living in the country one hundred years earlier.

Table 2
Agriculture's Share of the Labor Force by Region, 1890

Northeast	15%
Middle Atlantic	17%
Midwest	43%
South Atlantic	63%
South Central	67%
West	29%

Economic Trends Preceding the 1890s

Between 1870 and 1890 the number of farms in the United States rose by nearly 80 percent, to 4.5 million, and increased by another 25 percent by the end of the century. Farm property value grew by 75 percent, to $16.5 billion, and by 1900 had increased by another 25 percent. The advancing checkerboard of tilled fields in the nation's heartland represented a vast indebtedness. Nationwide about 29% of farmers were encumbered by mortgages. One contemporary observer estimated 2.3 million farm mortgages nationwide in 1890 worth over $2.2 billion. But farmers in the plains were much more likely to be in debt. Kansas croplands were mortgaged to 45 percent of their true value, those in South Dakota to 46 percent, in Minnesota to 44, in Montana 41, and in Colorado 34 percent. Debt covered a comparable proportion of all farmlands in those states. Under favorable conditions the millions of dollars of annual charges on farm mortgages could be borne, but a declining economy brought foreclosures and tax sales.

Railroads opened new areas to agriculture, linking these to rapidly changing national and international markets. Mechanization, the development of improved crops, and the introduction of new techniques increased productivity and fueled a rapid expansion of farming operations. The output of staples skyrocketed. Yields of wheat, corn, and cotton doubled between 1870 and 1890 though the nation's population rose by only two-thirds. Grain and fiber flooded the domestic market. Moreover, competition in world markets was fierce: Egypt and India emerged as rival sources of cotton; other areas poured out a growing stream of cereals. Farmers in the United States read the disappointing results in falling prices. Over 1870-73, corn and wheat averaged $0.463 and $1.174 per bushel and cotton $0.152 per pound; twenty years later they brought but $0.412 and $0.707 a bushel and $0.078 a pound. In 1889 corn fell to ten cents in Kansas, about half the estimated cost of production. Some farmers in need of cash to meet debts tried to increase income by increasing output of crops whose overproduction had already demoralized prices and cut farm receipts.

Railroad construction was an important spur to economic growth. Expansion peaked between 1879 and 1883, when eight thousand miles a year, on average, were built including the Southern Pacific, Northern Pacific and Santa Fe. An even higher peak was reached in the late 1880s, and the roads provided important markets for lumber, coal, iron, steel, and rolling stock.

The post-Civil War generation saw an enormous growth of manufacturing. Industrial output rose by some 296 percent, reaching in 1890 a value of almost $9.4 billion. In that year the nation's 350,000 industrial firms employed nearly 4,750,000 workers. Iron and steel paced the progress of manufacturing. Farm and forest continued to provide raw materials for such established enterprises as cotton textiles, food, and lumber production. Heralding the machine age, however, was the growing importance of extractives — raw materials for a lengthening list of consumer goods and for producing and fueling locomotives, railroad cars, industrial machinery and equipment, farm implements, and electrical equipment for commerce and industry. The swift expansion and diversification of manufacturing allowed a growing independence from European imports and was reflected in the prominence of new goods among US exports. Already the value of American manufactures was more than half the value of European manufactures and twice that of Britain.

Onset and Causes of the Depression

The depression, which was signaled by a financial panic in 1893, has been blamed on the deflation dating back to the Civil War, the gold standard and monetary policy, underconsumption (the economy was producing goods and services at a higher rate than society was consuming and the resulting inventory

accumulation led firms to reduce employment and cut back production), a general economic unsoundness (a reference less to tangible economic difficulties and more to a feeling that the economy was not running properly), and government extravagance .

Economic indicators signaling an 1893 business recession in the United States were largely obscured. The economy had improved during the previous year. Business failures had declined, and the average liabilities of failed firms had fallen by 40 percent. The country's position in international commerce was improved. During the late nineteenth century, the United States had a negative net balance of payments. Passenger and cargo fares paid to foreign ships that carried most American overseas commerce, insurance charges, tourists' expenditures abroad, and returns to foreign investors ordinarily more than offset the effect of a positive merchandise balance. In 1892, however, improved agricultural exports had reduced the previous year's net negative balance from $89 million to $20 million. Moreover, output of non-agricultural consumer goods had risen by more than 5 percent, and business firms were believed to have an ample backlog of unfilled orders as 1893 opened. The number checks cleared between banks in the nation at large and outside New York, factory employment, wholesale prices, and railroad freight ton mileage advanced through the early months of the new year.

Yet several monthly series of indicators showed that business was falling off. Building construction had peaked in April 1892, later moving irregularly downward, probably in reaction to over building. The decline continued until the turn of the century, when construction volume finally turned up again. Weakness in building was transmitted to the rest of the economy, dampening general activity through restricted investment opportunities and curtailed demand for construction materials. Meanwhile, a similar uneven downward drift in business activity after spring 1892 was evident from a composite index of cotton takings (cotton turned into yarn, cloth, etc.) and raw silk consumption, rubber imports, tin and tin plate imports, pig iron manufactures, bituminous and anthracite coal production, crude oil output, railroad freight ton mileage, and foreign trade volume. Pig iron production had crested in February, followed by stock prices and business incorporations six months later.

The economy exhibited other weaknesses as the March 1893 date for Grover Cleveland's inauguration to the presidency drew near. One of the most serious was in agriculture. Storm, drought, and overproduction during the preceding half-dozen years had reversed the remarkable agricultural prosperity and expansion of the early 1880s in the wheat, corn, and cotton belts. Wheat prices tumbled twenty cents per bushel in 1892. Corn held steady, but at a low figure and on a fall of one-eighth in output. Twice as great a decline in production dealt a severe blow to the hopes of cotton growers: the season's short crop canceled gains anticipated from a recovery of one cent in prices to 8.3 cents per pound, close to the average level of recent years. Midwestern and Southern farming regions seethed with discontent as growers watched staple prices fall by as much as two-thirds after 1870 and all farm prices by two-fifths; meanwhile, the general wholesale index fell by one-fourth. The situation was grave for many. Farmers' terms of trade had worsened, and dollar debts willingly incurred in good times to permit agricultural expansion were becoming unbearable burdens. Debt payments and low prices restricted agrarian purchasing power and demand for goods and services. Significantly, both output and consumption of farm equipment began to fall as early as 1891, marking a decline in agricultural investment. Moreover, foreclosure of farm mortgages reduced the ability of mortgage companies, banks, and other lenders to convert their earning assets into cash because the willingness of investors to buy mortgage paper was reduced by the declining expectation that they would yield a positive return.

Slowing investment in railroads was an additional deflationary influence. Railroad expansion had long been a potent engine of economic growth, ranging from 15 to 20 percent of total national investment in

the 1870s and 1880s. Construction was a rough index of railroad investment. The amount of new track laid yearly peaked at 12,984 miles in 1887, after which it fell off steeply. Capital outlays rose through 1891 to provide needed additions to plant and equipment, but the rate of growth could not be sustained. Unsatisfactory earnings and a low return for investors indicated the system was over built and overcapitalized, and reports of mismanagement were common. In 1892, only 44 percent of rail shares outstanding returned dividends, although twice that proportion of bonds paid interest. In the meantime, the completion of trunk lines dried up local capital sources. Political antagonism toward railroads, spurred by the roads' immense size and power and by real and imagined discrimination against small shippers, made the industry less attractive to investors. Declining growth reduced investment opportunity even as rail securities became less appealing. Capital outlays fell in 1892 despite easy credit during much of the year. The markets for ancillary industries, like iron and steel, felt the impact of falling railroad investment as well; at times in the 1880s rails had accounted for 90 percent of the country's rolled steel output. In an industry whose expansion had long played a vital role in creating new markets for suppliers, lagging capital expenditures loomed large in the onset of depression.

European Influences

European depression was a further source of weakness as 1893 began. Recession struck France in 1889, and business slackened in Germany and England the following year. Contemporaries dated the English downturn from a financial panic in November. Monetary stringency was a base cause of economic hard times. Because specie — gold and silver — was regarded as the only real money, and paper money was available in multiples of the specie supply, when people viewed the future with doubt they stockpiled specie and rejected paper. The availability of specie was limited, so the longer hard times prevailed the more difficult it was for anyone to secure hard money. In addition to monetary stringency, the collapse of extensive speculations in Australian, South African, and Argentine properties; and a sharp break in securities prices marked the advent of severe contraction. The great banking house of Baring and Brothers, caught with excessive holdings of Argentine securities in a falling market, shocked the financial world by suspending business on November 20, 1890. Within a year of the crisis, commercial stagnation had settled over most of Europe. The contraction was severe and long-lived. In England many indices fell to 80 percent of capacity; wholesale prices overall declined nearly 6 percent in two years and had declined 15 percent by 1894. An index of the prices of principal industrial products declined by almost as much. In Germany, contraction lasted three times as long as the average for the period 1879-1902. Not until mid-1895 did Europe begin to revive. Full prosperity returned a year or more later.

Panic in the United Kingdom and falling trade in Europe brought serious repercussions in the United States. The immediate result was near panic in New York City, the nation's financial center, as British investors sold their American stocks to obtain funds. Uneasiness spread through the country, fostered by falling stock prices, monetary stringency, and an increase in business failures. Liabilities of failed firms during the last quarter of 1890 were $90 million — twice those in the preceding quarter. Only the normal year's end grain exports, destined largely for England, averted a gold outflow.

Circumstances moderated during the early months of 1891, although gold flowed to Europe, and business failures remained high. Credit eased, if slowly: in response to pleas for relief, the federal treasury began the premature redemption of government bonds to put additional money into circulation, and the end of the harvest trade reduced demand for credit. Commerce quickened in the spring. Perhaps anticipation of brisk trade during the harvest season stimulated the revival of investment and business; in any event, the harvest of 1891 buoyed the economy. A bumper American wheat crop

coincided with poor yields in Europe increase exports and the inflow of specie: US exports in fiscal 1892 were $150 million greater than in the preceding year, a full 1 percent of gross national product. The improved market for American crops was primarily responsible for a brief cycle of prosperity in the United States that Europe did not share. Business thrived until signs of recession began to appear in late 1892 and early 1893.

The business revival of 1891-92 only delayed an inevitable reckoning. While domestic factors led in precipitating a major downturn in the United States, the European contraction operated as a powerful depressant. Commercial stagnation in Europe decisively affected the flow of foreign investment funds to the United States. Although foreign investment in this country and American investment abroad rose overall during the 1890s, changing business conditions forced American funds going abroad and foreign funds flowing into the United States to reverse as Americans sold off foreign holdings and foreigners sold off their holdings of American assets. Initially, contraction abroad forced European investors to sell substantial holdings of American securities, then the rate of new foreign investment fell off. The repatriation of American securities prompted gold exports, deflating the money stock and depressing prices. A reduced inflow of foreign capital slowed expansion and may have exacerbated the declining growth of the railroads; undoubtedly, it dampened aggregate demand.

As foreign investors sold their holdings of American stocks for hard money, specie left the United States. Funds secured through foreign investment in domestic enterprise were important in helping the country meet its usual balance of payments deficit. Fewer funds invested during the 1890s was one of the factors that, with a continued negative balance of payments, forced the United States to export gold almost continuously from 1892 to 1896. The impact of depression abroad on the flow of capital to this country can be inferred from the history of new capital issues in Britain, the source of perhaps 75 percent of overseas investment in the United States. British issues varied as shown in Table 3.

Table 3
British New Capital Issues, 1890-1898 (millions of pounds, sterling)

1890142.6
1891104.6
189281.1
189349.1
189491.8
1895104.7
1896152.8
1897157.3
1898150.2

Source: Hoffmann, p. 193

Simultaneously, the share of new British investment sent abroad fell from one-fourth in 1891 to one-fifth two years later. Over that same period, British net capital flows abroad declined by about 60 percent; not until 1896 and 1897 did they resume earlier levels.

Thus, the recession that began in 1893 had deep roots. The slowdown in railroad expansion, decline in building construction, and foreign depression had reduced investment opportunities, and, following the brief upturn effected by the bumper wheat crop of 1891, agricultural prices fell as did exports and commerce in general. By the end of 1893, business failures numbering 15,242 averaging $22,751 in

liabilities, had been reported. Plagued by successive contractions of credit, many essentially sound firms failed which would have survived under ordinary circumstances. Liabilities totaled a staggering $357 million. This was the crisis of 1893.

Response to the Depression

The financial crises of 1893 accelerated the recession that was evident early in the year into a major contraction that spread throughout the economy. Investment, commerce, prices, employment, and wages remained depressed for several years. Changing circumstances and expectations, and a persistent federal deficit, subjected the treasury gold reserve to intense pressure and generated sharp counterflows of gold. The treasury was driven four times between 1894 and 1896 to resort to bond issues totaling $260 million to obtain specie to augment the reserve. Meanwhile, restricted investment, income, and profits spelled low consumption, widespread suffering, and occasionally explosive labor and political struggles. An extensive but incomplete revival occurred in 1895. The Democratic nomination of William Jennings Bryan for the presidency on a free silver platform the following year amid an upsurge of silverite support contributed to a second downturn peculiar to the United States. Europe, just beginning to emerge from depression, was unaffected. Only in mid-1897 did recovery begin in this country; full prosperity returned gradually over the ensuing year and more.

The economy that emerged from the depression differed profoundly from that of 1893. Consolidation and the influence of investment bankers were more advanced. The nation's international trade position was more advantageous: huge merchandise exports assured a positive net balance of payments despite large tourist expenditures abroad, foreign investments in the United States, and a continued reliance on foreign shipping to carry most of America's overseas commerce. Moreover, new industries were rapidly moving to ascendancy, and manufactures were coming to replace farm produce as the staple products and exports of the country. The era revealed the outlines of an emerging industrial-urban economic order that portended great changes for the United States.

Hard times intensified social sensitivity to a wide range of problems accompanying industrialization, by making them more severe. Those whom depression struck hardest as well as much of the general public and major Protestant churches, shored up their civic consciousness about currency and banking reform, regulation of business in the public interest, and labor relations. Although nineteenth century liberalism and the tradition of administrative nihilism that it favored remained viable, public opinion began to slowly swing toward governmental activism and interventionism associated with modern, industrial societies, erecting in the process the intellectual foundation for the reform impulse that was to be called Progressivism in twentieth century America. Most important of all, these opposed tendencies in thought set the boundaries within which Americans for the next century debated the most vital questions of their shared experience. The depression was a reminder of business slumps, commonweal above avarice, and principle above principal.

Government responses to depression during the 1890s exhibited elements of complexity, confusion, and contradiction. Yet they also showed a pattern that confirmed the transitional character of the era and clarified the role of the business crisis in the emergence of modern America. Hard times, intimately related to developments issuing in an industrial economy characterized by increasingly vast business units and concentrations of financial and productive power, were a major influence on society, thought, politics, and thus, unavoidably, government. Awareness of, and proposals of means for adapting to, deep-rooted changes attending industrialization, urbanization, and other dimensions of the current transformation of the United States long antedated the economic contraction of the nineties.

Selected Bibliography

*I would like to thank Douglas Steeples, retired dean of the College of Liberal Arts and professor of history, emeritus, Mercer University. Much of this article has been taken from *Democracy in Desperation: The Depression of 1893* by Douglas Steeples and David O. Whitten, which was declared an Exceptional Academic Title by Choice. *Democracy in Desperation* includes the most recent and extensive bibliography for the depression of 1893.

Clanton, Gene. *Populism: The Humane Preference in America, 1890-1900*. Boston: Twayne, 1991.

Friedman, Milton, and Anna Jacobson Schwartz. *A Monetary History of the United States, 1867-1960*. Princeton: Princeton University Press, 1963.

Goodwyn, Lawrence. *Democratic Promise: The Populist Movement in America*. New York: Oxford University Press, 1976.

Grant, H. Roger. *Self Help in the 1890s Depression*. Ames: Iowa State University Press, 1983.

Higgs, Robert. *The Transformation of the American Economy, 1865-1914*. New York: Wiley, 1971.

Himmelberg, Robert F. *The Rise of Big Business and the Beginnings of Antitrust and Railroad Regulation, 1870-1900*. New York: Garland, 1994.

Hoffmann, Charles. *The Depression of the Nineties: An Economic History*. Westport, CT: Greenwood Publishing, 1970.

Jones, Stanley L. *The Presidential Election of 1896*. Madison: University of Wisconsin Press, 1964.

Kindleberger, Charles Poor. *Manias, Panics, and Crashes: A History of Financial Crises*. Revised Edition. New York: Basic Books, 1989.

Kolko, Gabriel. *Railroads and Regulation, 1877-1916*. Princeton: Princeton University Press, 1965.

Lamoreaux, Naomi R. *The Great Merger Movement in American Business, 1895-1904*. New York: Cambridge University Press, 1985.

Rees, Albert. *Real Wages in Manufacturing, 1890-1914*. Princeton, NJ: Princeton University Press, 1961.

Ritter, Gretchen. *Goldbugs and Greenbacks: The Antimonopoly Tradition and the Politics of Finance in America*. New York: Cambridge University Press, 1997.

Romer, Christina. "Spurious Volatility in Historical Unemployment Data." *Journal of Political Economy* 94, no. 1. (1986): 1-37.

Schwantes, Carlos A. *Coxey's Army: An American Odyssey*. Lincoln: University of Nebraska Press, 1985.

Steeples, Douglas, and David Whitten. *Democracy in Desperation: The Depression of 1893*. Westport, CT: Greenwood Press, 1998.

Timberlake, Richard. "Panic of 1893." In *Business Cycles and Depressions: An Encyclopedia*, edited by David Glasner. New York: Garland, 1997.

White, Gerald Taylor. *Years of Transition: The United States and the Problems of Recovery after 1893*. University, AL: University of Alabama Press, 1982.

Citation: Whitten, David. “Depression of 1893 . EH.Net Encyclopedia, edited by Robert Whaples. August 14, 2001. URL http://eh.net/encyclopedia/the-depression-of-1893/

1. First
2. <<
3. 6
4. 7
5. 8
6. 9
7. 10
8. 11
9. 12
0. >>
1. Last