

LATE 19TH AND EARLY 20TH CENTURY UNITED STATES BUSINESS CYCLES
AND MONETARY POLICY

By

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DEDICATION

To my friends I have known all my life, to my family who has taken such great care of me, and to my teachers who have taught me so well.

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ABSTRACT

LATE 19TH AND EARLY 20TH CENTURY UNITED STATES BUSINESS CYCLES AND MONETARY POLICY

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My dissertation deals with late 19th and early 20th century United States monetary and macroeconomic history. The three chapters are on the Depression of 1873-1879, the Depression of 1920-1921, and the Federal Reserve's monetary policy in the 1920s. All three place a unique economic perspective on the various historical episodes and seek to engage the contemporary literature in innovative ways. In particular, the first two utilize Austrian Business Cycle Theory (ABCT) and argue that these depressions were the result of unsustainable booms. They also argue that the depressions ended due to market based natural recoveries and were aided, and not inhibited by, the prevailing laissez faire policies of the time. The third investigates a hotly debated topic among monetary historians about whether Federal Reserve monetary policy in the 1920s was expansionary or contractionary, an issue that has relevance for understanding the Great Depression. I argue that the Federal Reserve did in fact engage in expansionary monetary policy, although I leave for future research the particular business cycle implications of this.

The first chapter deals with the period 1867-1879 in American economic history from an “Austrian” perspective. The post-Civil War boom, the Panic of 1873, and the subsequent Depression of 1873-1879 are investigated in light of ABCT and its structure of production framework. It shows how recent Civil War legislation allowed for monetary inflation and a boom to develop in the 1870s that inevitably turned into a bust. However, since the federal government pursued a policy of relative *laissez faire*, the economy successfully recovered. Consequently, there was no prolonged depression in the 1870s, despite it being known as the longest period of economic contraction in modern United States history which surpassed even the Great Contraction (1929-1933). Contemporaries overstated the severity and length of the depression because they relied on nominal rather than real series, and confused nominal price declines for declines in real output. In addition, they also engaged in poor data collection, which provided very incorrect information and made them overstate the severity of the decline in economic activity (such as in unemployment figures).

The second chapter examines the American post-World War 1 boom and bust. It argues that the Federal Reserve’s monetary easing from 1919 to 1920 created an ABC and the collapse of the boom initiated the Depression of 1920-1921. The Depression, while relatively unknown, is noted for being unusually severe but also relatively brief. The specific causes and consequences of the Depression, as well as its relationship to the effectiveness of traditional countercyclical policies, have come under increased scrutiny since the 2007-2009 financial crisis. In particular, while many have argued that the depression ended quickly due to the prevailing fiscal and monetary contraction, many have

countered that the depression was an unusual idiosyncratic episode that does not have much applicability to other downturns and recovery was in fact due to the Federal Reserve's monetary easing from 1921-1922. The subsequent laissez faire policy promoted a swift recovery which began following a severe liquidation of firms, reallocation of resources, and wage cuts stimulated by fiscal and monetary contraction. Contrary to some other accounts, significant recovery began before the Federal Reserve's 1921-1922 monetary easing affected the economy.

The third chapter analyzes the two main divergent interpretations of Federal Reserve monetary policy in the 1920s, the expansionary view described by the Rothbard and the earlier "Austrian" writers, and the contractionary view most notably held by Friedman and Schwartz and later monetary historians. It argues in line with the former that the Federal Reserve engaged in expansionary monetary policy during the 1920s, as opposed to the gold sterilization view of the latter. The main rationale for this argument is that the increase in the money supply was driven by the increase in the money multiplier and total bank reserves, both of which were caused primarily by Fed policy (i.e., a decrease in reserve requirements and an increase in controlled reserves, respectively). Showing that this expansion did in fact occur provides the first step in supporting an ABCT interpretation of the 1920s, namely that the Federal Reserve created a credit fueled boom that led to the Great Depression, although this is not pursued in the chapter.

CHAPTER 1 THE DEPRESSION OF 1873-79: AN AUSTRIAN PERSPECTIVE

Section I: Introduction

With the recent financial meltdown in 2008, Austrian economics has experienced a revival by both professional and popular commentators. As documented by Cachanosky & Salter (2013) and Salerno (2012), much of this attention is directed towards Austrian Business Cycle Theory (ABCT) which places government manipulations of the interest rate and distortions in the production structure as the cause of economic booms. Significant focus is also placed on critically examining the policy of *laissez faire* that is often associated with the theory during the ensuing bust (e.g. Horwitz 2011; Kuehn 2011; Murphy 2009; Thornton 2010).

Since the advent of the economic crisis also reinvigorated a general interest in studying business cycles and the application and efficacy of monetary and fiscal policies, this chapter provides an analysis of ABCT by examining an American business cycle from the 19th century. The 19th century was a period of relatively minimal government action compared to the 20th century, and as a result a detailed study of this period provides a different perspective on the effects of macroeconomic policies. Specifically, it allows for an analysis of the 1870s boom (1870-73) and bust (1873-79), which the NBER designates as the longest contraction in modern American history (Sutch 2006a, series Cb5-8). The experience of the 1870s provides a unique window into economic history because the data

from this period are more accurate compared to the early 19th century and it allows for a rare investigation of output growth during a monetary contraction.

The present work is closer in line with those papers that analyze ABCT from a historical-economic perspective (e.g. Callahan & Garrison 2003; Hughes 1997; Powell 2002; Rothbard 2008; Salerno 2010a; Salerno 2012) instead of an econometric study (e.g. Bismans & Mougeot 2009; Fisher 2013; Keeler 2001; Lester & Wolff 2013; Luther & Cohen 2014; Mulligan 2006; Wainhouse 1984; Young 2012). The existence of an ABC in the 1870s illustrated by showing the appearance of a significant credit expansion and confirming that prices and production behaved in a manner explainable by the theory.¹ The chapter shows how political legislation allowed for monetary inflation to cause a boom and bust in the 1870s that is explainable by ABCT. Furthermore, since the federal government pursued a policy of relative *laissez faire*, the economy successfully recovered and the length of the perceived bust (1873-79) is grossly exaggerated.

The chapter is structured as follows: Section II provides a summary analysis of ABCT and related theories. Section III explains the relevant data, especially the figures regarding the money supply and industrial production, as well as describing how they will be used to show an ABC in the chapter. Section IV provides the necessary historical analysis of monetary institutions and the economic narrative for the three time periods of study: 1867-73, 1873-75, and 1875-79 and Section V concludes the chapter.

¹ Space constraints preclude a more thorough study that discerns between other rival business cycle theories.

Section II: Theory

The following section provides a brief summary of what can be called “capital based macroeconomics” (Garrison 2001, 7-8). This review is essential as capital based macroeconomics is extensively used to interpret the economic landscape from 1867-79, particularly the movements in relative prices and production, and as a result it is important to have the theories clearly stated.

Capital based macroeconomics emphasizes the importance and interrelatedness of time preference (the proportion of consumption to investment spending), the interest rate (the price spread or rate of return between stages of production), and the structure of production. The structure of production can be described as the temporal process where goods in the “higher order” stages (a shorthand term for those production processes that are more temporally remote from consumption) are worked on and sold to the “lower order” stages (a shorthand term for those production processes that are more temporally close to consumption) until they become finished goods and sold to the consumer. These relationships are graphically represented in the simplified diagram in Figure 1.

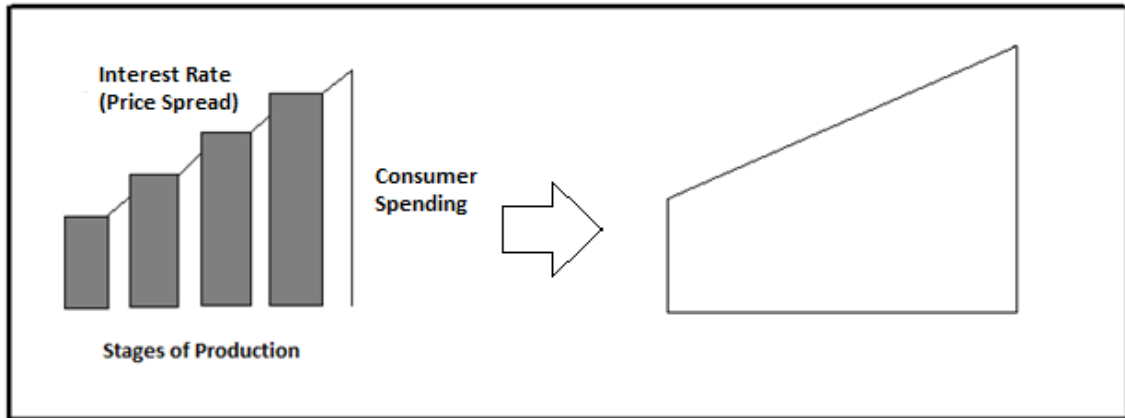


Figure 1: The Structure of Production²

In capital based macroeconomics, changes in the production structure occur through changes in time preference. A decrease in time preference results in a lower interest rate and the creation of additional stages of production. Savings are channeled through the credit market and the loanable funds interest rate drops. The decline in consumption spending reduces prices in the lower orders while the increase in investment spending raises prices in the higher orders, i.e., prices in the former fall relative to before as well as to the latter. The additional investment funds are spent on creating higher order goods as the economy engages in relatively more long term production processes. The process continues as the public spends their constant money income at their lower time preferences.

² For more intricate structure of production diagrams, the following sources can be consulted: for Figure 1, see Hayek (2008a, 233), Garrison (2001, 47), Huerta de Soto (2006, 293), Rothbard (2009, 369) and Skousen (2007, 203); Figure 2, see Hayek (2008a, 239), Garrison (2001, 62), Huerta de Soto (2006, 334), Rothbard (2009, 521), and Skousen (2007, 235); Figure 3, see Hayek (2008a, 242 and 244), Garrison (2001, 69), Huerta de Soto (2006, 356 and 383) and Skousen (2007, 288 and 296).

The opposite occurs with an increase in time preferences. The process is depicted in Figure 2.³

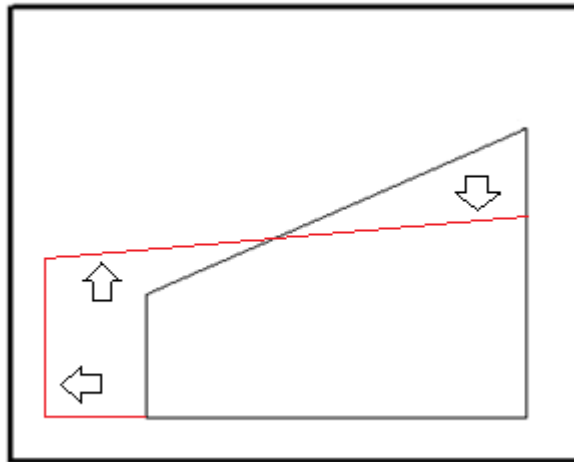


Figure 2: Time Preference induced growth

The situation is different when the increase in investment is financed through credit expansion. Here the money supply increases as additional bank credit enters the loanable funds market. This can be called inflation.⁴ As a result, the loanable funds interest rate drops and is distorted because it no longer reflects time preferences. Firms that receive the additional supply of bank credit respond by increasing investment in the higher orders and

³ For a more in depth overview of Austrian structure of production theory and this basic growth scenario, see Garrison (2001, 33-67), Hayek (2008a, 223-40), Huerta de Soto (2006, 266-346), Rothbard (2009, 319-555), and Skousen (2007, 133-264).

⁴ More specifically, inflation occurs when the increase in the money supply is not offset by an increase in the demand for money (Mises 2009, 240; 2004, 44-45). This definition is different than the one proposed by Rothbard (2009, 990; 2008, 12).

because of the increase in spending aggregate money incomes also increase. A boom begins.

Since time preferences have not changed the public spends their enlarged income at their old time preference spending patterns which pushes prices up in the lower orders.⁵ Whereas in the earlier growth scenario, lower order prices fall both relatively to higher order prices and to before, now lower order prices rise relative to before. The reassertion in time preferences relative to the period of credit expansion and the resultant price increases in the lower orders reveals the unprofitability of the newly embarked investment projects, known as malinvestments. In a modern complex economy, booms are prolonged because banks continue to expand credit and entrepreneurs temporarily mask the unprofitability of the increased investment through additional borrowing. However the bank credit still filters down and enlarges money incomes, which causes another rise in consumer spending and reassertion of time preferences. Through a combination of tightened money from overexpanded banks and the eventual realization of entrepreneurs that many of their investment projects are unprofitable, the boom ends.⁶

The next phase of the cycle is the necessary liquidation of unprofitable lines of production and the reorganization of the economy according to current time preferences. Since time preferences are actually higher than planned by entrepreneurs, the capital

⁵ The inflation can actually cause capital consumption through an accounting illusion (Mises 2008, 549-50; Rothbard 2009, 993-94). When this occurs, time preferences increase.

⁶ For a more in depth analysis of ABCT, see Garrison (2001, 67-83), Hayek (2008a, 241-47), Huerta de Soto (2006, 347-84), Mises (2008, 542-63), Rothbard (2009, 994-1004), and Skousen (2007, 282-331).

structure must shorten and the rate of interest rise. In order for that to occur, relative prices are bid down in the overextended lines of production to reflect the higher price spread and infeasibility of the more temporally remote production stages. Unprofitable businesses contract and allow their resources to be reabsorbed and more efficiently used elsewhere, particularly in the comparatively more lucrative shorter production processes. In essence, it calls for a policy of laissez faire. The entire cycle of boom and bust (ABC) is shown in Figure 3. Phase 1 represents the initial expansion of investment spending into the higher orders. Phase 2 shows the reassertion of time preferences and the unprofitability of investment projects. Phase 3 depicts the necessary corrections.

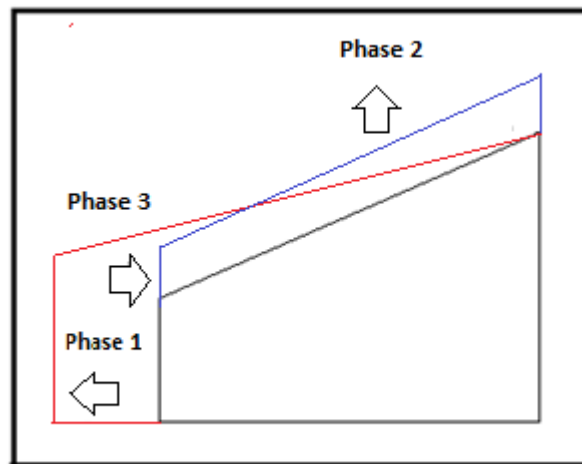


Figure 3: Credit expansion induced growth

Although during the bust the main adjustments that must take place are relative to reflect higher time preferences, contractions in the money supply can also occur. This credit contraction is called deflation.⁷ Under such a scenario, prices in the economy must adjust both relatively to reflect the higher price spread and nominally to reflect the changes in total spending.⁸ Credit contraction also has other effects. Firstly, it can cause unanticipated capital accumulation that provokes lower time preferences which increases the relative profitability of the malinvested investment goods and allows for prices to fall less than they would have in the absence of the effect. Unlike inflation that causes capital consumption because individuals do not realize their profits are fictitious, deflation overstates losses and causes businessmen to spend the same amount of money on factor inputs in the economy even though their prices have fallen. Instead of not saving enough for factor inputs whose prices have risen, the fall in spending provokes the opposite effect (Mises 2008, 547; Rothbard 2009, 1006).

Just as the credit expansion described above distorts interest rates, so too can credit contraction. There are however important differences between the two. Credit contraction is directly beneficial to speeding up the adjustment process during a bust by correcting both the loan market and production structure's rates of interest to the higher one supportable

⁷ More specifically, it is a decrease in the supply of money not offset by a decrease in the demand for money (Mises 2009, 240).

⁸ The following arguments regarding a decline in nominal spending are different than those Austrians who adhere to Monetary Disequilibrium Theory. For supporters of this theory, such a scenario of "secondary deflation" (declines in nominal spending during the bust) aggravates the downturn through various sticky-price induced arguments and necessitates the need for a stabilization in nominal spending either by government or private banks. See Garrison (2001, 221-43) and Horwitz (2000, 141-75; 2006; 2014) for a more in depth explanation.

by current time preferences. It results in a higher price spread by stopping the growth in loans to businesses that have facilitated the boom, which causes the demand for factor inputs and products in the temporally remote stages of the economy to fall and relatively lowers their prices. Credit contraction may raise loan and production structure rates of interest higher than deemed necessary by existing time preferences, and in this sense can be considered distortionary. However, due to the reduction in investment businesses pay smaller amounts to original factors, who in turn, with reduced money incomes, spend less on consumption. Price spreads fall in accordance with the lower time preferences and the market rates adjust (Mises 2008, 564-65; Rothbard 2008, 18; Rothbard 2009, 1005-06).

Section III: Data

This section presents the rationale behind the particular data sources and series used. Much of this analysis may seem overly technical and out of place, but since this chapter applies ABCT and other Austrian economic insights there must be a proper analysis behind the data that are used to describe these theories. For example, the selected Austrian definitions of the money supply and the breakdown of the structure of production into higher orders and lower orders are cited extensively in Section IV and therefore must be accurately defined in order to provide a clear exposition of the relevant economic concepts.

The numerical data are presented in Tables 2-4. They include data on money supply, interest rates, prices, and production. The per annum growth rates of all data except interest rates are presented, in addition to the level figures of interest rates in relevant years. Growth rates are used to show relative movements over time.

Gross National Product

Because the United States only started recording Gross National Product (GNP) figures in 1929, a variety of historical series were created in an attempt to present an accurate picture of the macro-economy in earlier years. The construction of such series has been described as a “work in progress” and are less precise than modern figures as the underlying data were not collected for the purpose of making GNP estimates (Rhodes & Sutch 2006, 3-12).

The three GNP series used in the analysis are taken from Balke & Gordon (1989), Johnston & Williamson (2008), and Romer (1989). These three are the latest GNP series devised for the period and are more accurate for measuring annual movements than earlier series that were designed for more long term measurements. In addition, the annual industrial production index by Davis (2004a) that is used to analyze specific compositional changes in the production structure (see below) serves as a suitable proxy for GNP and is also included. Numbers for the series can be found in Davis (2004b), Johnston & Williamson (2013) and Sutch (2006b, series Ca213 and Ca216).⁹

Since the series were composed using different methods and none have been conclusively accepted as the most accurate, it is best to incorporate them all. The discrepancy among them suggests that the best conclusion is to use the averages of small intervals for the individual series, and use the smallest as the average lower bound and the highest as the average upper bound. To use these series with individual years seems

⁹ It should be noted that the Johnston & Williamson series incorporates the Davis industrial production index in its annual observations (Johnston & Williamson, 2008).

inappropriate, especially since there will be an urge to compare them to more accurate modern estimates that incorporate a much larger pool of data and can be precisely broken down in minute detail. Rationale for the particular bounds chosen is given at the beginning of Section IV.

Government Spending and Taxation

While analyzing changes in government spending and taxation is undoubtedly important for a work that deals with historical macroeconomic policy, its small size relative to output makes it inconsequential for this period. After steeply rising during the Civil War, federal spending sharply declined in the post-war period and then gently fell throughout the 1870s (Wallis 2006a, series Ea584-87). In addition, save for the Civil War, the federal government during this period ran surpluses as tax revenue was greater than expenditures. Given the chosen method for estimating annual GNP figures and the dearth of annual figures for state and local governments (Wallis 2006b, 5-3), it is hard to paint a reliable picture of annual changes in total government spending and taxation to gauge fiscal policy. It is for this reason that detailed figures on annual changes in taxation and spending have not been included. However, it can safely be said that significant activist fiscal policy was nonexistent in this period, including the depression years.

Interest Rates

Unfortunately, detailed collection of interest rates during this period is scanty. The most reliable figures are yields on government bonds and short term interest rates on commercial paper and call money. Given the limited data, the interest rates used are the rates on 60-90 day commercial paper. Their movements are assumed to roughly mirror

interest rates on general loans. It is important to remember that during a credit expansion there are other factors that influence the rates of interest on various financial assets. For example, during a credit expansion, other economic factors such as a rise in the risk premium or an expectation of a rise in prices may counteract the increase in the supply of loanable funds from credit expansion and raise the loan interest rate (Mises 2008, 549-50 and 556; Rothbard 2008, 85). The interest rates are taken from James & Sylla (2006, series Cj1223).

Money Supply

In order to appropriately depict changes in the monetary environment during this period, proper money supply figures are needed. Following Rothbard (2011, 736-39), a general money supply figure, M_a (a = Austrian), and a more specific figure, M_b (b = business cycle) are defined. The first is useful for showing aggregate monetary influences on the economy, while the second serves as a suitable estimate for gauging business cycle generating bank credit.

The general money supply M_a consists of the base money (specie) and all money substitutes. The definition of a money substitute here comes from Mises (2008, 429-31) and includes all notes and deposits that the public perceives as always redeemable for a definite amount of the base money (such as the par value). This not only includes money that is usable in exchange, but also instruments that must first be converted into an exchangeable type of money. For the relevant period M_a includes specie, government notes

(such as greenbacks), bank notes, commercial bank demand and time deposits, and mutual savings bank time deposits.¹⁰

In order to accurately depict the effects of credit expansion on the structure of production one must concentrate solely on the increases in *Ma* created through business loans and investments (*Mb*). Specie and notes can be removed because they are currency and do not cause a business cycle. Deposits at mutual savings banks can also be removed as most of their investments during this period were in government securities or small residential mortgages and were thus not cycle generating (Teck 1968, 42; Welfling 1968, 67). This leaves us with total commercial demand and time deposits. With this in mind it can be stated that *ceteris paribus* (i.e., the demand for money), an increase in commercial bank deposits is synonymous with an increase in business cycle generating bank credit and investments to private firms.

The specific money supply figures are taken from Friedman & Schwartz (1993, 704) as opposed to the figures used by Rothbard (2005, 153-54). Due to the imperfections of the statistical collection of the figures used by the latter, they are undoubtedly inferior to the Friedman & Schwartz estimates.¹¹ Using those figures would significantly overstate

¹⁰ This particular definition of *Ma*, best defended in Rothbard (2011, 727-39) and Salerno (2010b, 115-30), is different from other Austrian definitions such as Mises (2008, 429-31, 459-63) and White (1989, 203-17) mainly because it considers time deposits that are in and of themselves not exchangeable for goods as money substitutes. While space constraints unfortunately preclude a thorough defense of this definition, it should be noted that for this time period it essentially corresponds to the M3 definition provided by Friedman & Schwartz (1970, 79-81).

¹¹ Due to new Civil War legislation (explained below), the government stopped collecting statistics on state banks based on the belief that they would disappear, which turned out to be untrue (Friedman & Schwartz 1993, 3). As a result there is a large drop in state bank figures at the end of the Civil War which continued until the early 1870s. Furthermore, the

credit expansion during the boom and would in fact continue to show credit expansion after the bust, which was not the case.

Prices and Production

As explained earlier, ABCT describes a structural adjustment in the macroeconomy that manifests itself through relative changes in prices and production. In order to show this, prices from Hanes (2006, series Cc114-21), and sector specific industrial figures from Davis (2004b) are used. The individual price and production series are divided into the higher orders and the lower orders and are presented in Table 1. This dichotomization is not meant to be literal, indeed, such an inappropriate categorization is akin to organizing the production structure into strict “consumer goods” and “producer goods” industries (Hayek 2008, 444; Rothbard 2009, 543). To reiterate, the “stages” or “orders” of an economy are merely shorthand reference for the length of production processes and/or the temporal distance of a good from the consumer good it helps to produce. The distinctions are only meant to distinguish those sectors of the economy whose profitability would be most likely affected by credit expansion. Those industries designated as higher orders are the most capital intensive and temporally remote from consumption.

figures may include mutual savings banks as well as loan and trust companies (Bodenhorn 2006, 3-634).

Table 1: Prices and Production series¹²

Production			Prices
	Industry	Composed primarily of:	Industry
Lower Orders	Wood & Paper products	Lumber shipments, Newspapers	Farm products
	Textile & Textile products	Cotton consumption	Textile products
	Food & Kindred products	Milled wheat flour, Refined sugar consumption, Hog packing, Beef packing	Food
	Leather & Leather products	Sole leather, Leather hides	Hides & Leather products
Higher Orders	Chemicals & Fuel	Anthracite coal, Bituminous coal, Crude petroleum	Chemicals & Drugs
	Transport Equipment & Machinery	Merchant ships, Locomotives, Reaping machinery; steel plows	Building materials
	Metals & Metal products	Pig iron production, Tinsmithing, Bessemer and open-hearth steel	Metals & Metal products
	-----		Fuel & Lighting

¹² Sources for the components of the Production industries can be found in Davis (2004a, 1188). The components are taken from the largest series in the 1880 weights.

During the post-Civil war era there was a large expansion in the railroad and railroad related industries (Cain 2006, series Df874; Fishlow 2000, 583-84). They were a major American industry and financially accounted for 15-20% of American capital investment (Moseley 1997, 148). Economically, they were large projects that required a variety of land, labor, and capital, and completing a railroad was a significant long term investment dependent on heavy financing. Because the federal government was eager to create transcontinental railroads to stimulate growth into the Western States, in the Civil War and post-Civil War era an enormous amount of government railroad land grants and subsidies were given and a little over a third of the increase in railroad production during this period came from land grants (Burch 1981, 16; Fishlow 2000, 585).¹³ However, undoubtedly a significant factor was also credit expansion as railroad production and its related industries constitute long term production processes which credit expansion increases the profitability of most. The changes in production in this industry will be shown through the Transport Equipment & Machinery figures, which contains locomotives as an included series.¹⁴

As stated earlier, an inflationary boom is signaled through a relative increase in the prices and production of the higher orders while at the same time a relative increase in the

¹³ In particular, in 1862 Congress passed the Pacific Railway Act which created the Union Pacific and Central Pacific, and in 1864 Congress also created the Northern Pacific. The first two received money subsidies, and all three received land subsidies. (Folsom 1991, 18, 22-23).

¹⁴ Railroad track mileage will not be included in the relative structure of production comparisons in the economic analysis. The Davis series is a self-contained industrial production index; to compare railroad miles with those figures would be inappropriate as it was neither designed like the other series nor meant to be compared in such a fashion.

lower orders to before, with the opposite occurring during the bust. Likewise, a recovery driven by lower time preferences manifests itself as a relative increase in the higher orders with both a relative decline in the prices of the lower orders to the higher orders and to before. Of course, in the real world, one change never occurs isolated, so other factors are always influencing the economic landscape and counteract the visible effects of credit expansion. But what matters is that these credit induced restructuring processes still occur alongside the other forces.¹⁵

Section IV: Historical and Economic Analysis, 1867-79¹⁶

The intervals were chosen to best capture the macroeconomic trends during each period. The first two periods 1867-70 and 1870-73 were chosen to best distinguish changes in the economy during periods of credit expansion. The third period 1873-75 was chosen because it was the post-panic years listed by Wicker (2000, 30-31) while the fourth period 1875-79 was chosen to include the rest of the purported depression years listed by Sutch (2006a, series Cb5-8) and the monetary contraction that ended in early 1879 by Friedman & Schwartz (1993, 704). It is noticeable in the output series that exceptionally strong

¹⁵ Historically an increase in saving or technological innovation usually occurs alongside a credit expansion. In this case (which applied to this period) during the boom prices may decline, but still change relative to what they would have been had the credit expansion not taken place. Such economic forces do not eliminate the boom but only obscure it (Mises 2008, 558; Rothbard 2008a, 169-70). This fact reinforces the use of per annum growth rates to show movements in relative prices. If a price is falling in one period but then falls less (i.e. the growth rate becomes less negative) in the next period, it can be said that the price relatively increased.

¹⁶ All growth rates are compounded annually. For the monetary periods 1873-75 and 1875-79, the intervals also include half years, and as such the growth rates are adjusted accordingly.

growth occurred in 1879. Extending the growth analysis to 1875-79 would overestimate GNP growth and give a less than accurate picture of the time period. Therefore, only the money supply and interest rate figures are extended to early 1879 (to include the rest of the monetary contraction in 1878) while the other series end in 1878. Each section contains a historical analysis of the relevant monetary institutions and an economic analysis of the production structure and other pertinent information.

Part 1: The Post-Civil War Boom, 1867-73

Historical Analysis

After severe difficulties in financing the war, in late 1861 private banks suspended specie conversion on their notes and deposits as well as the federal government on its Treasury demand notes. Thus, for roughly the next 20 years the United States was off the gold standard. Subsequently Congress passed several Legal Tender Acts that provided the Treasury with \$449 million “greenbacks” for the war effort (Friedman & Schwartz 1993, 24). At the end of the war in 1865 the total supply of greenbacks stood at \$400 million (Timberlake 1993, 133), and afterwards Congress contracted them to \$356 million by the end of 1867. From 1867-70 the federal government retired most of the Treasury demand notes that were remnants of the wartime economy (Friedman & Schwartz 1993, 24 and 54).

In addition, in 1863 and 1864 Congress passed the National Currency Acts (later known as the National Banking Acts) which caused a complete overhaul of the previous decentralized banking system by creating a group of so called national banks. For such institutions the legislation stipulated minimum capital requirements, restricted real estate

loans, prevented branch banking and created an Office of the Comptroller of the Currency that had the ability to charter new banks and supervise them (White 1982, 34). National banks could only issue notes up to 90% of the value of federal government securities they deposited with the Treasury (Klein 1970, 141). This bond backing requirement and the total ceiling limit on national bank note issues (at \$300 million) made their issuance very restrictive, and in 1870 Congress increased the maximum number of national bank notes outstanding (to \$354 million). These notes soon became the only bank notes available after Congress passed a law in 1865 that stipulated a 10% annual tax on all state bank note issues after July 1866 in order to force all state banks to become national banks (Friedman & Schwartz 1993, 18-21). However, the punitive tax on state bank notes only reduced their note issues and did not force them out of business. The growing use of deposits and the lower regulatory requirements still made state banks a profitable institution, and they became an important factor in much of the credit expansion of this period.

More importantly, the acts created a multi-tiered financial system that allowed banks to pyramid credit on the same set of reserves (Klein 1970, 144).¹⁷ Before in the pre-Civil War era system each bank held their own reserves in terms of their own specie and excessive credit expansion was prevented by other banks and depositors redeeming their notes and deposits. However now banks could consider interest paying deposits at other banks as reserves, which weakened this mechanism and lead to greater credit creation.

¹⁷ The term “pyramiding of credit” refers to when one bank holds part of their reserves in the form of another bank’s liability, and banks “pyramid” credit off of the same of base reserves (in this period, lawful money).

The system worked as follows. The National Banks were divided into three subcategories based on size and location: central reserve city banks, reserve city banks, and country banks. Central reserve city and reserve city banks faced reserve requirements of 25% while country banks had 15%. While central reserve city banks had to keep 25% of their notes and deposits in “lawful money”, i.e., greenbacks and specie, reserve city banks could split their reserves into a minimum of 50% lawful money and up to 50% in interest paying deposits at central reserve city banks. Country banks had a minimum of only 40% lawful money reserves and could keep up to 60% in interest paying deposits at either central reserve city or reserve city banks (Friedman & Schwartz 1993, 56-57; Rothbard 2005, 136-37). Furthermore, most states allowed state banks to use national bank notes as reserves. State banks held deposits at national banks where they could “buy” notes to redeem deposits as their own notes were unprofitable to circulate due to the federal tax (Friedman & Schwartz 1993, 21; Rothbard 2005, 144). Thus a multi layered credit pyramid was formed with state banks pyramiding off of any national bank, country banks off of central reserve city and reserve city banks, and reserve city banks off of central reserve city banks where lawful money reserves were generally concentrated in.

Overall, the National Banking Act encouraged greater credit expansion by thwarting the competitive adverse clearing mechanism that would normally limit excessive deposit and note issuance. Much of the monetary expansion during this period was due to the banks adapting to this new system.

Economic Analysis

The economic climate in this period can be broken up into two parts: from 1867-70, when there was mild growth in M_a and M_b , and from 1870-73, when there was large increase in both. The results, presented in Table 2, show that in the latter period the familiar symptoms of an Austrian style boom appeared, which would make sense given the run up in credit expansion.

From 1867-70 both M_a and M_b increased by a relatively small amount. The growth in M_a was due mainly to the increase in both commercial and mutual savings bank deposits as currency during this period actually declined. In the second period, however, monetary conditions were much different. From 1870-73 both M_a and M_b increased by enormous annual rates compared to the prior period.

While this was partly due to currency increasing, most of the rise came from an increase in mutual savings bank and nonnational bank deposits. The nonnational banks were able to expand credit from both the increase in national bank notes made possible in 1870 and the lawful money reserves that came from the national banking system. As explained earlier, the national banking system allowed banks to hold a large portion of their reserves in interbank deposits, which made it possible for them to decrease their lawful money reserves. As time progressed and the national banking system matured, many of these lawful money reserves found their way into the nonnational banking system (which had lower reserve requirements on average) and caused an increase in credit expansion that impacted both M_a and M_b (Friedman & Schwartz 1993, 56-57).

Table 2: U.S Economy, 1867-73 (per annum growth rates and levels)

Interest Rates (level)				
1867	1870	1871	1872	1873
7.32%	7.23	6.98	8.63	10.27

Money (growth rates)		
	1867-70	1870-73
Ma	2.75%	10.15
Mb	2.23	11.16

GNP (growth rates)		
	1867-70	1870-73
Davis	4.97%	7.53
J&W	3.20	7.20
B&G	---	4.57
Romer	---	7.45
Bounds	3.2-4.97	4.57-7.53

Production (growth rates)				Prices (growth rates)		
	Industry	1867-70	1870-73	Industry	1867-70	1870-73
Lower Orders	Wood & Paper	4.23%	4.22	Farm	-5.56%	-2.75
	Textile	4.03	11.16	Textile	-6.64	-0.75
	Food	5.56	7.56	Food	-5.93	-4.25
	Leather	-1.20	-5.93	Leather	-1.02	1.03
Higher Orders	Chemicals & Fuel	9.81	10.66	Chemicals & Drugs	-4.57	-3.11
	Machinery	6.15	11.35	Building	-5.58	1.62
	Metals	8.66	10.56	Metals	-6.91	6.70
	---	---	---	Fuel & Lighting	-2.37	3.36

It is clear that during both periods there was strong growth. Comparisons of GNP between 1867-70 and 1870-73 can only be made with the Davis and the Johnston & Williamson figures as the Balke & Gordon and Romer series start later. One can observe the difference between the Davis and Johnston & Williamson figures and in the overall bounds to see that there was a marked increase in growth rates.

Crucial to showing an ABC is comparing the production structures in the two periods. As stated above, there was a large increase in credit expansion starting in 1870. Consequently, one would expect the familiar symptoms. Production wise, when comparing the two periods the higher order industries expanded the most.¹⁸ In particular Machinery experienced a large jump in growth rates between the periods, which fits neatly with the railroad boom at the time.

However, movements in prices tell a more revealing story. Since the end of the Civil War, massive growth in the money supply subsided and combined with large increases in the output of goods, prices began a long secular downward trend that would last until the late 1890s. As explained earlier, what matters are the relative prices between the higher orders and the lower orders. In the period of low credit expansion, prices in both groups decreased at roughly similar rates. During the second period of high credit expansion, prices in the higher orders relatively rose to the lower orders and in almost all

¹⁸In this analysis based on the earlier classification of higher and lower orders the Textile group played the role of an outlier as evident in Table 2. However, its unusual growth appears to be the result of its own industry specific fluctuations, as it experienced virtually no growth from 1865-70, unlike every other group in the Davis series. One could be tempted to include it as a higher order industry, but it is far more conservative for the study to not change its categorization.

cases rose in even nominal amounts.¹⁹ By comparing the relative prices, it is clear that the economy was attempting to conform to a longer capital structure. But since the prices in industries closest to consumption were also rising relative to before, the change in the economy was symptom of an ABC. Interest rates also tell a similar story. From 1867-70 interest rates slightly fell.²⁰ At the beginning of the significant credit expansion from 1870-71 interest rates continued to fall. However from 1871-73 interest rates began to rise.²¹ This reflects the increased demand for loans by entrepreneurs in order to bid away factors of production and continue to embark upon their production processes. The changes in the production structure during this time are graphically shown by Figure 3, particularly Phases 1 & 2.

As shown above, credit expansion induced changes in the structure of production cannot last forever, and a correction in prices and production would have to occur in the near future.

Part II: The Panic of 1873 and Bust, 1873-75

Historical Analysis

In late 1872 and early 1873 financial and economic conditions started to decline, and investors began to pull money out of businesses, particularly railroads. In the first eight months of 1872 bank loans increased slowly, and at the end of August depositors withdrew

¹⁹ Though they still rose relative to before, chemicals prices did continue to fall during this period, although they increased absolutely from 1871 onward.

²⁰ There was a sharp run up in interest rates in 1869, but this was almost certainly a consequence of the attempted cornering of the gold market by Jay Gould and James Fisk that culminated in “Black Friday” (Morris 2006b, 69-75).

²¹ Part of the rise in 1873 was due to the Panic of 1873, but what matters is that the trend had begun in 1872.

large amounts of cash in New York banks. The Treasury shored up the situation by purchasing \$5 million worth of bonds to increase bank reserves, but by the spring of 1873 another seasonal difficulty developed, and banks struggled to raise cash to meet withdrawals by selling securities due to the weakening bond market (Studenski & Krooss 1952, 181).

Despite avoiding spillover effects from a Vienna stock market crash in May of 1873, Wall Street was hit with a great shock when Jay Cooke & Co. closed its doors on September 18th, full of worthless Northern Pacific railroad securities (Wicker 2000, 20). Stocks plummeted and the New York Stock exchange responded by closing for 10 days on September 20th (Glasner 1997, 133). The concentration of funds in New York's central reserve city banks lead to a withdrawal by other banks calling in their deposits. With the New York City banks unable to meet all of their demands, the New York Clearing House (NYCH) stepped in and issued clearinghouse loan certificates and pooled reserves. The equalization of reserves allowed seven major New York banks to meet banker demands for withdrawal and pay out cash. Despite the noble efforts, cash payment to depositors was suspended (Wicker 2000, 31). In addition, during the crisis there were a number of bank suspensions, which occurs when a bank either temporarily or permanently closes. The number of banks that suspended payment totaled 101, the majority coming from New York and Pennsylvania who had a combined 59 bank suspensions (Wicker 2000, 19). By the end of October, cash redemption was resumed in most banks except a few in the South (Sprague 1968, 68-71).

Wicker (2000, 33) analyzed the surrounding financial events and concluded that the suspension of cash payments was actually unnecessary, given that the banks were in good shape. Most of the suspensions came from brokerage houses, which were banks with variably priced deposits based on the value of assets (in essence speculative investments and not money) and not commercial banks. Contrary to its purpose, it ended up aggravating hoarding and uncertainty, making it harder for businesses near banks to continue daily operations. The incentive to deposit cash in banks was lowered for many people and some chose to deposit currency in their own safes instead. In fact, the suspension may have even lead to panic among reserve city and country banks, contributing to further withdrawals from New York.

Government action during this time period could be considered mildly expansionary. There was a temporary \$26 million increase in retired greenbacks from the Treasury following the panic that were legalized (i.e., made permanent) by a bill in 1874, bringing the total up to \$382 million (Friedman & Schwartz 1993, 24 and 47). Ultimately the bill was more expansionary through its changes with regards to the national banking system by removing reserve requirements against notes, and its consequences are explained below. However, changing economic realities and government policy starting in 1875 prevented the act from having an expansionary impact for the rest of the decade.

Economic Analysis

The turbulent crisis years following the Panic of 1873 are compared with the prior boom period of 1870-73. It is apparent after looking at the figures presented in Table 3 that output growth definitely entered a slowdown and was mainly concentrated in higher order

goods that were most affected by credit expansion, which is what one would expect under ABCT.

Overall, the panic did not cause a devastating monetary contraction and in fact both M_a and M_b grew. The rates of increase were definitely smaller compared to the prior period, although they were higher than the amounts from 1867-70. The increases in M_a predominantly and in M_b entirely came during 1874-75. The source was mostly due to the recent monetary legislation in 1874 which freed the national banks from the requirement of a reserve against note issue. This in effect released base lawful money into the banking system that could be used for the additional creation of deposits (Friedman & Schwartz 1993, 57; Rothbard 2005, 141). It would have been far better for the economy if the government did not intervene in the monetary affairs by making it easier to increase credit. The government promoted expansion in credit distorts prices and production compared to what they would have been at a time when the market was adjusting them downwards. After rising during the panic, interest rates then sharply fell below their pre panic level. This was undoubtedly due both to the increase in bank credit as well as a large drop in business demand for loans after realizing many of their projects were unprofitable.

Table 3: U.S Economy, 1870-75 (per annum growth rates and levels)

Interest Rates (level)				
1873	1874	1875	---	---
10.27%	5.98	5.44	---	---

Money (growth rates)		
	1870-73	1873-75
Ma	10.15%	3.81
Mb	11.16	4.16

GNP (growth rates)		
	1870-73	1873-75
Davis	7.53%	-3.02
J&W	7.20	0.81
B&G	4.57	2.25
Romer	7.45	1.47
Bounds	4.57-7.53	-3.01-2.25

Production (growth rates)				Prices (growth rates)		
	Industry	1870-73	1873-75	Industry	1870-73	1873-75
Lower Orders	Wood & Paper	4.22%	0.20	Farm	-2.75%	-1.96
	Textile	11.16	-0.95	Textile	-0.75	-10.23
	Food	7.56	6.94	Food	-4.25	-0.82
	Leather	-5.93	8.71	Leather	1.03	-3.46
Higher Orders	Chemicals & Fuel	10.66	0.18	Chemicals & Drugs	-3.11	-9.26
	Machinery	11.35	-17.84	Building	1.62	-7.85
	Metals	10.56	-5.24	Metals	6.70	-15.13
	---	---	---	Fuel & Lighting	3.36	-7.00

Looking at revised GNP estimates, growth only contracted in the Davis series and slowed down in the others. Despite the sharp downturn in his series, Davis concluded that the depression in fact only lasted from 1873-75 (Davis 2006, 106). In the other series while severe slowdowns occurred, they were certainly not the massive decline in output one would label as the beginning of a depression.²² As visibly seen from Table 3, the drop in output was not uniform among sectors and instead was concentrated in the higher order industries that were the most affected by credit expansion, specifically in Machinery and Metals, while the lower orders were much less relatively affected. With regards to prices the situation was similar, with the higher orders, particularly Metals, taking the brunt of the fall in prices, while lower order goods fell at a much weaker rate.²³ It is clear that the sectors with the largest contractions in prices and production were the industries that were most affected by the boom. Consequently, they needed their prices and production levels to fall the most in order to allow the economy to properly adjust to the steeper production structure price spread. This paved the way for a subsequent recovery during the latter half of the 1870s. Overall, the movements in prices and production can be shown by Phase 3 of Figure 3.

²² Rockoff and Wicker also have somewhat similar views on the economic effects of the panic, with Rockoff (2000, 669) stating that “The crisis did not leave a strong impression on the aggregate economic statistics,” and Wicker (2000, 30) commenting that “Contemporary accounts describe the post-panic [1873-75] years of contraction as years of almost unrelieved gloom. But the evidence for such gloom is certainly not apparent in the Romer-Balke-Gordon estimates of real GNP.”

²³ The exception in this period being again Textiles.

Part III: The Recovery and Resumption, 1875-79

Historical Analysis

In January of 1875 Congress passed the Specie Resumption Act, which planned to bring the nation back on the gold standard at the prewar parity by January of 1879. It allowed the Treasury to accumulate a gold reserve using surplus revenue and proceeds from bond sales that would act as a “redemption fund” for specie convertibility. It also allowed for a retirement of greenbacks through an increase in national bank notes, though retirement was suspended in mid-1878, capping the greenbacks at \$346 million (Friedman & Schwartz 1993, 24 and 48). Due to the perceived downturn caused by the panic, there was continued agitation for monetary expansion, which partly took the form of the “free silver” movement that advocated the remonetization of silver. Despite the passage of the Bland Allison Act in 1878 that forced the Treasury to purchase \$2 to 4 million of silver a month for coinage, the Treasury was able to work towards resumption and from 1877-79 refunded a large amount of debt to build up a redemption fund (Friedman & Schwartz 1993, 82-84). In the end, on January 2nd 1879, the U.S successfully resumed specie payments and returned to the gold standard.

Economic Analysis

The rest of the supposed depression years of the 1870s are compared with the initial crisis years of 1873-75. Despite a declining money supply, Table 4 shows that in virtually all of the economic indicators there was a visible recovery. In addition, qualitative evidence is presented that suggests the reason that there was perceived to be an enormous depression

from 1873-79 was mainly due to faulty economic statistics and reliance on nominal rather than real values.

Both M_1 and M_2 in this period declined at significant amounts that were only very rarely seen in U.S economic history (Friedman & Schwartz 1993, 31 and 299). Although this was partly due to the government enforced monetary contraction following the Resumption Act, the decline was mainly due to the contraction of credit following a series of bank runs after 1876. The run on banks was fostered by weakened confidence in the banking system and led to multiple nonnational bank suspensions, who responded by building up their reserves (Friedman & Schwartz 1993, 56-57 and 82). As explained earlier, this type of monetary contraction can be part of a healthy process of recovery by speeding up the economy's return to its sustainable price spread.

Table 4: U.S Economy, 1873-79 (per annum growth rates and levels)

Interest Rates (level)				
1875	1877	1878	---	---
5.44%	5.01	4.82	---	---

Money (growth rates)		
	1873-75	1875-79
Ma	3.81%	-2.78
Mb	4.16	-4.11

GNP (growth rates)		
	1873-75	1875-78
Davis	-3.02%	3.37
J&W	0.81	4.10
B&G	2.25	2.86
Romer	1.47	6.77
Bounds	-3.01-2.25	2.86-6.77

Production (growth rates)				Prices (growth rates)		
	Industry	1873-75	1875-78	Industry	1873-75	1875-78
Lower Orders	Wood & Paper	0.20%	-2.91	Farm	-1.96	-10.07
	Textile	-0.95	9.81	Textile	-10.23	-6.56
	Food	6.94	3.11	Food	-0.82	-8.14
	Leather	8.71	-0.83	Leather	-3.46	-8.24
Higher Orders	Chemicals & Fuel	0.18	2.89	Chemicals & Drugs	-9.26	-5.18
	Machinery	-17.84	1.14	Building	-7.85	-7.16
	Metals	-5.24	8.91	Metals	-15.13	-10.37
	---	---	---	Fuel & Lighting	-7.00	-10.10

It is partly due to this decline in the money supply, alongside the falling price level, that justified the belief that there was a long and protracted depression up until the beginning of 1879. However, it is certainly not apparent from the GNP estimates, as almost all of the series from 1875-78 show a sharp rebound in growth as compared to 1873-75. The only one that did not was the Balke & Gordon index, which one could reasonably argue understates growth in the mid to late 1870s because one of the main series they build off of was the railroad output dominated Frickey transportation and communications index (Balke & Gordon 1989, 53). Despite having shown enormous growth during the boom, it is well known to both contemporaries and economic historians that railroads suffered an especially severe decline relative to the rest of the economy during this period (Morris 2006b, 105-06). From an Austrian perspective, one would certainly expect poor growth after a period of excessive expansion. Thus, basing a GNP series partly on railroads would reasonably underestimate expansion. Production figures show that the sectors with the sharpest recovery were those of the higher orders, particularly in Machinery and Metals. Recovery was also apparent in the price indexes as prices of the higher orders relatively rose compared to the lower orders, which mostly fell relative to before.²⁴ Wages were also flexible during this period and fell from 1873-79. After rising 5.55% from 1870-73, hourly nominal manufacturing wage rates fell 3.27% from 1873-75, and from 1875-79 fell 13.27%. In total from 1873-79 they fell 16.11% (Margo 2006, series Ba4290).²⁵ Similarly, interest rates throughout this period also fell. The growth for this period was healthy and

²⁴ Textiles again serving as an outlier.

²⁵ On the lack of downward nominal wage rigidity in the late 19th century in the 1860s and 1870s, see Hanes & James (2003).

sustainable as it signified a lowering of time preferences and was not influenced by an expansion in bank credit. It is graphically portrayed by Figure 2.

So why did contemporary reports describe awful conditions in economic welfare? The main reason is that prices fell all around. If businesses based their outlooks on nominal series, they could be fooled with the belief of a contracting economy. This belief however was purely an illusion and in fact encouraged capital accumulation and a lowering of time preferences through the reasoning described earlier. Overall, businessmen did not consider the decline in the cost of their inputs and hence overstated their losses and wage earners did not realize that consumer prices also dropped and their real income did not decline as much as they thought (Morris 2006b, 103-04).²⁶ A similar argument can be found in Davis (2006, 115). After he determined new recession year benchmarks for the 19th century, Davis found that the years with the biggest differences were during recessions with large price and monetary contractions. Davis' explanation was a similar reason in that businesses concentrated on nominal series rather than real series. Falling prices, however, do not imply a depression.

Popular news reports also had little way of knowing entire nationwide estimates of economic performance and tended to poorly estimate production. The Commissioner of Labor at the time stated that "There was much apprehension to be added to reality" (Kleppner 1979, 124-25). Reznack (1950, 497), whose classic article famously gave a

²⁶ Real income for unskilled labor did decline during this period before drastically catching up throughout the 1880s. However, the decline in real income was much less than the decline in nominal income, which undoubtedly exacerbated the perceived effects of income stagnation (Morris 2006b, 103).

negative picture of the 1870s, even admitted that “contemporary appraisals of the intensity of depression tended to be the more alarming by their very vagueness and contributed to the prevailing pessimism.”

Americans were also confused by the growing modernization of the country. Large grain farmers began to replace smaller family owned farms, newly emerging department stores and mail order catalogs broke up previous local artisanal monopolies, increasing social and geographic mobility disturbed older traditional family security, and rising inequality from both market and political entrepreneurs bred resentment (Morris 2006a). Overall, the lack of reliable information and the changing economic environment brought exaggerated conditions with regards to the depth of the depression, especially concerning unemployment.²⁷ Modern estimates of unemployment also tend to be inaccurate in light of more recent economic data. Lebergott (1971, 80) provides an estimate of over two million, which would roughly correspond to 13% in the depths of the depression. Vernon’s (1994, 710) annual unemployment series is more reasonable, but still shows unemployment rising until it peaks at 8.25% in 1878, which seems hard to believe given the GNP growth rates.²⁸

²⁷ For example, a New York relief agency estimated that during 1873 roughly 25% of the city’s working force was unemployed. They arrived at this estimate by counting all of the people who they helped during the year. Their error came in including nonworking children and housewives, and by simply adding up the sum of the people they helped in each month without realizing they were double counting (Feder 1936, 39-40). Many other figures, such as those of the Chronicle newspaper, were also erroneous as some of their unemployment reports for certain industries were grossly exaggerated and based on incomplete information (Morris 2006b, 104-05).

²⁸ After selecting full employment benchmark years, he derives his estimates by regressing on the Balke & Gordon series and uses Okun’s law to get a figure of deviations from trend of output to produce annual unemployment rates (Vernon 1994, 702-07). With respect to the period under analysis, there are a number of problems with this approach. Firstly, although growth was undeniably lower in the mid-1870s compared to before 1873, this

Overall, both quantitative and qualitative suggest that the contraction in the 1870s was much shorter than previously assumed and there was no prolonged slump during this period.

Section V: Conclusion

ABCT explains the boom and bust that stretched across the time period analyzed. Following a run-up in credit expansion that occurred in the early 1870s, a visible widening in both relative prices and production compared to the late 1860s emerged that fostered multiple malinvestments in the higher orders. The expansion was largely caused by the Civil War monetary legislation that created the National Banking System. Both state and national banks were able to pyramid credit on the same set of lawful money reserves through the use of interest paying interbank deposits. The money supply continued to expand during the bust years, which showed symptoms of an Austrian contraction with the decline in output and prices concentrated in industries that overexpanded during the boom. Largely the result of bank runs, the money supply contracted for the remainder of the supposed depression years. This decline was shown to have actually hastened the recovery and during this period there was a noticeable rebound in growth.

does not mean that economic stagnation occurred and unemployment rose, especially considering that the boom years were infeasible and not really “trend” growth. While it is reasonable to see unemployment rising during the recession of 1873-75, after a sufficient fall in costs and reallocation of resources the idle labor would have been reabsorbed into the economy. Under such a dramatic change in production, one would not see growing unemployment throughout the recovery, which is what the series suggests. Secondly, it is important to note that Vernon derives his Okun’s law percentage from the years 1900-40, a period of greater policy mandated wage rigidity, especially during the Great Depression, and of much greater rigidity than what actually occurred in the 1870s. Thirdly, he uses Balke & Gordon’s annual series, which one can reasonably expect to understate growth.

The length of the depression was perceived to be from 1873-79 when in reality it was closer to 1873-75 because contemporary accounts relied on nominal series and had poor access to aggregate economic information. And aside from some monetary interventions from 1873-79, there was no significant fiscal or monetary stimulus yet the economy recovered. Indeed, the recovery is an example of how an economy can successfully correct itself when the government steps out of the way and allows the market to reallocate resources. It can be concluded that there was no prolonged depression in the 1870s. On this period Rothbard (2005, 154-55) appropriately writes that “It should be clear, then, that the “great depression” of the 1870s is merely a myth—a myth brought about by misinterpretation that prices in general fell sharply during the entire period.”

CHAPTER 2 THE DEPRESSION OF 1920-1921: A CREDIT INDUCED BOOM AND A MARKET BASED RECOVERY?

Section I: Introduction

After decades of neglect, the American Depression of 1920-1921 and subsequent recovery have regained the attention of economic historians and journalists debating the appropriate government policies to promote recovery from the 2007-2009 financial crisis. The depression is generally noted for its sharp decline in prices and production that occurred after the sharp run up in the money supply and prices that occurred during and after World War I (WWI). Despite the harsh contraction and the apparent lack of fiscal and monetary stimulus, the economy briskly recovered. James Grant (2014), following Murphy (2009), Powell (2009), and Woods (2009a), has offered it as a case study of how recovery was promoted and not inhibited by fiscal austerity and non-expansionary monetary policy, or *laissez faire*.²⁹ All these writers echo earlier work by Benjamin Anderson (1945, 25) who characterized it as “Our Last Natural Recovery to Full Employment.”³⁰

Kuehn (2011, 2012) criticized the natural recovery *laissez faire* view described by Murphy (2009), Powell (2009), and Woods (2009a). He argues, among other things, that fiscal contraction mostly preceded the depression and that monetary easing in 1921-1922

²⁹ See also Woods (2009b, 94-96) and Salerno (2010 [2003], 279-82).

³⁰ Rothbard (2008 [1963], 186) also echoed Anderson’s account.

in fact sparked the recovery (Kuehn 2011, 276-78, 284-85; Kuehn 2012, 156, 158). Vigorous discussion filled subsequent blog posts and other popular outlets, such as Krugman (2011a, 2011b), DeLong (2011), Selgin (2011), Boudreaux (2011), Krugman (2012a, 2012b), Murphy (2012), and Glasner (2012). Grant's (2014) book has prompted another round of discussion, including Cato (2014), Rosser (2014), Krugman (2014), Murphy (2014a), Selgin (2014), Glasner (2014), Murphy (2014b), Glasner (2015) and DeLong (2015).³¹ Critics of the laissez faire view have generally pointed to the unusual characteristics of the depression and the monetary easing that took place from 1921-1922. There are now various interpretations on both sides.

This chapter argues that the depression did in fact end from a natural recovery, and this was due to a market reallocation of resources spurred on by the intense liquidation and fiscal and monetary contraction which continued during the downturn. Recovery began around the first round of wage cuts in March 1921 and before the monetary easing that began in mid-1921. In order to fully understand the Depression of 1920-1921 and the subsequent market reallocation, one must first understand what caused the depression and what the market was recovering from. In other words, if the market is required to *reallocate* resources, they must have been *misallocated* in the first place. What caused this cluster of misallocated resources and bad, or mal-investments in 1920? In addition, why was the cluster of errors concentrated in certain industries more than others?

³¹ See also Social Democracy (2014), which is a compilation of one prominent Post Keynesian blogger's various critiques of many Austrian and Libertarian studies of the episode.

This chapter argues that Austrian Business Cycle Theory (ABCT) answers these questions and not only explains the 1920-1921 Depression and recovery but also the postwar boom that caused the bust. Briefly, ABCT argues that government promoted credit expansion distorts the interest rate and leads to an unsustainable boom that misallocates resources, which leads to a bust in which resources must be reallocated. The unequal sectoral shifts in the boom, bust, and recovery of the postwar era are all explainable by ABCT. As will be explained below, data limitations and other constraints prevent a thorough econometric testing of ABCT, and as a result the empirical analysis is in line with previous research that analyzes ABCT from a historical-economic perspective rather than an econometric study. Making the case for both a market based recovery and an ABCT explanation means responding to Kuehn (2011, 2012), so far the most academic contributions to the discussion, and also considering previous examinations of the Depression by economic historians, including Friedman & Schwartz (1993 [1963]), Romer (1988), Vernon (1991), and Bordo et al. (2007).³² It should be noted though that while Kuehn criticized the natural recovery view, he appears sympathetic to the Austrian credit cycle interpretation of the depression, and has argued for Austrians to provide a more rigorous empirical analysis that traces out the specific malinvestments (Kuehn 2011, 274, 288-89).

The chapter is structured as follows. Section II provides an outline of ABCT and related theories, as well as how it will be applied. Sections III, IV, and V break down the

³² Murphy (2009), Salerno (2010), and Woods (2009a, 2009b) also argue for an ABCT explanation, while Powell (2009) and Grant (2014) do not.

postwar era and provide the requisite historical and economic analysis, and Section VI concludes.

Section II: Theory

*Austrian Business Cycle Theory*³³

In a nutshell, Austrian Business Cycle Theory (ABCT) argues that credit expansion, generally through a central bank, artificially pushes loan interest rates below what is determined on the market by time preferences and thereby creates an unsustainable boom. While superficially this is similar to a fall in time preferences and an increase in savings, their effects are very different, since the credit expansion has distorted the loan rate below what is consonant with time preferences. The low interest rate incentivizes entrepreneurs to expand in the “higher orders” (a phrase referring to lengthy production processes that are temporally remote from consumption) and increase their relative prices and bid away scarce factors from the “lower orders” (a phrase referring to short production processes that are temporally close to consumption). However as the new money percolates down to the public through increased incomes due to the higher prices of factors of production, they spend it according to their unchanged time preferences, which means that there are not enough voluntary savings to sustain the newly embarked upon investments, now revealed to be malinvestments. The crisis either reveals itself then or the central bank needs to pump

³³ Space constraints preclude a more in depth explanation of ABCT and related theories. For more information on sustainable growth from a fall in time preferences and unsustainable growth from an increase in credit expansion, the necessary reallocation and liquidation process during the depression, and the importance of fiscal and monetary contraction during the bust, see Newman (2015, 476-79) and the sources cited therein.

in new credit into the economy to be reinvested in the higher orders, which in turn gets spent by the public according to their old time preferences. The higher order businesses continually face rising costs and declining revenue (i.e. decreased profitability) which they must overcome through increased borrowing as the public continually increases consumption spending. Eventually, the boom ends through a combination of tightened credit expansion and the inevitable realization of businessmen that their projects are unprofitable.

The bust phase is known as the depression and is when the unprofitable lines of production are liquidated, creating a rise in unemployment and idle capacity. Loan market rates of interest must rise and relative prices of higher-order inputs fall to reflect current time preferences. In this view the painful bust and subsequent downturn is a necessary period of adjustment as resources are liquidated and reallocated to more profitable ventures consonant of societal time preferences after they were misallocated in the form of malinvestments. The depression marks the beginning of the recovery process when this beneficial adjustment occurs. Output starts to increase, and “recovery” in the traditional sense occurs, when enough resources are being sufficiently reallocated and unemployed resources reabsorbed. Of course, some malinvestments can continue to be liquidated after the recovery has already begun.

In short, the depression calls for a policy of *laissez faire*. Government intervention in the form of either expansionary fiscal or monetary policy during the depression stifles the recovery. Expansionary fiscal policy in the form of increased government spending siphons away savings from the productive profit and loss private sector to the unproductive

government sector that relies on taxation (Mises 2008 [1949], 792-94). Increased credit expansion runs the risks of propping up the malinvestments by preventing their liquidation and igniting another boom, which prevents the economy from feasibly growing again (Mises 2008, 576-78; Rothbard 2008 [1963], 19). Outright credit contraction can actually speed the recovery process by raising loan interest rates and lowering relative higher order prices to what is consonant with time preferences, as credit contraction relatively reduces loans to the higher orders, which reduces their demand for factors and comparatively lowers higher order prices and production. In addition, it can also provoke increased real savings through unanticipated capital accumulation caused by traditional bookkeeping methods (Mises 2008, 547, 564-65; Rothbard 2009 [1962], 1005-06; 2008, 18). Consequently, for these reasons credit contraction should actually be encouraged (Rothbard 2008, 21, 163; Mises 2009 [1953] 15). It will be argued below that during the Depression of 1920-1921 both contractionary fiscal and monetary policy were undertaken which hastened the recovery.

The limitations of empirically illustrating ABCT

We can break the historical record into three periods that encapsulate the boom, bust, and recovery. The first, March 1919 to January 1920, is the dating of the postwar boom by the NBER and others (Sutch 2006a; Aldcroft 1977, 64; Anderson 1979 [1949], 62; O'Brien 1997, 152; Soule 1947, 81). The boom was preceded by the brief postwar downturn that began in August 1918. Although Kuehn (2011, 289) argues the need to describe the malinvestments of the war years to show the Austrian interpretation for 1920-1921, this is not needed. During the war years a large part of the money supply was created

not through the producers' loan market for expansion in private industry, but instead through loans to the public and banks to buy war bonds. As this was in essence credit expansion to finance government activities, this does not cause an ABC (Mises 2008, 568; Rothbard 2011 [1978], 737-38). This is not to deny that the widespread reorganization of the economy during this time geared towards supplying domestic and foreign countries with war armaments constituted distortions and malinvestments, but only that they were not part of an ABC. However, it does pose complications for our analysis that are discussed below. Therefore, only a brief summary of the period before March 1919 is given in order to provide sufficient background.

The second is from January 1920 to March 1921. Although the NBER dates the bust from January 1920 to July 1921, this appears to be too long. Romer (1994, 592), after arguing that the old NBER business cycle dates were derived from antiquated methods, has revised many business cycle reference dates. For the period under study, while the length of the expansions preceding and following the contraction remained the same, the contraction in her reckoning only lasted until March 1921. The third, March 1921 to May 1923, is the recovery, which includes both a free market recovery from the reallocation of resources and cuts in prices and wages and the beginning of a new ABC boom promoted by the Federal Reserve's credit expansion in 1921-1922.

The general facts appear to fit a "boom-bust" framework. The boom was unusually brief, less than a year, and prices moved with unusual sharpness. There was a large increase in the money supply during the boom that encouraged private investment and raised prices,

and a large decrease during the bust that lowered prices. During the bust industrial production collapsed and there were numerous bankruptcies and business failures.

To show that this episode strictly fits the Austrian theory of boom and bust requires one to show an unsustainable rise in the relative prices and production of the higher order stages in the boom and reversals in the bust. As opposed to when time preferences fall, with credit expansion there is not only a relative increase in higher order prices and production but also a relative increase in the prices of the lower orders relative to before, with the opposite occurring during the depression (Newman 2014, 477, 485-85).

It is important to reiterate that the phrases higher and lower order stages are shorthand references for the lengths of production processes and its temporal distance from the completion of the consumer good that it helps to produce. A good is classified as belonging in the higher orders when it is involved in a comparatively long production process that produces consumer goods in the remote future, and vice versa for the lower orders. What ultimately matters is if the good is involved in producing consumer goods for the near or far future (Hayek 2008 [1931], 444).

Unfortunately we lack reliable microeconomic temporal “structure-of-production” data as most data collected is understandably constructed according to more macroeconomic aggregative demands (Kuehn 2013, 513). Even stage-of-process data, which one may argue is the strongest of the available data, can be misleading because they say nothing about the good’s temporal distance from consumption as there is little data on

the length of various production processes (Skousen 2007, 172, 271-72).³⁴ Recently, Luther & Cohen (2016) have noted this problem with regards to recent empirical tests of ABCT in the post WWII era. If such “Austrian” production length data is hard to come by for modern empirical tests, it is practically nonexistent for earlier periods such as the one under study.

In place of a strict econometric empirical test of ABCT, which cannot be used due to data limitations, this chapter employs the historical illustrative approach taken in an earlier study by the present author, which divides the components of wholesale price and industrial production indexes into what may be reasonably considered higher and lower orders, and show that their movement is consistent with the ABCT outlined earlier. One may understandably consider this a weak “test” of the theory’s applicability to the period, but it appears that the available data do not allow a stronger test. The historical economic approach taken by Newman (2014) and others, which just try to illustrate an ABC, is in contrast to the econometric ABCT studies that try to quantitatively test ABCT (Newman 2014, 483-84). As Young (2011, 72) points out, the two should not be seen as substitutes but as compliments.

³⁴ This is the problem with the using the available stages-of-process data. One would expect during the beginning of an ABC boom that raw material prices rise more than semi manufactured goods, which in turn rise more than finished manufactured goods. During the 1919-1920 boom this did *not* hold, at least judging from the yearly Bureau of Labor Statistics (BLS) data (Hanes 2006). However, this only makes sense assuming that all raw materials are temporally more remote than manufactured goods, which in turn are more remote than finished goods. This does not seem to be the case from looking at the list of commodities in each group, as there is a general mix of what may be considered higher and lower orders across each classification (BLS 1929, 62).

This chapter utilizes the yearly Shaw (1947) commodity output series, which is based on a wide variety of primary data on durable and nondurable consumer goods, and fixed and circulating capital goods. A rival index is the monthly Federal Reserve Board (FRB) index of industrial production (BOG 2015), but this index is inferior to the Shaw series because it is heavily weighted towards primary products and is overly volatile, which is a characteristic also attributable to the yearly Commerce GNP series relative to the yearly Kendrick GNP series during this time (Romer 1988, 101). However, the monthly FRB index will be used later when analyzing the precise timing and movements during years, as there is no better option available on a monthly basis. The Romer-Miron (1990) index is a potential candidate, but it is even more volatile and was not even used by Romer (1994) to date business cycles, who also uses the FRB index. Romer (1988) and Balke & Gordon's (1989) GNP series are also used to capture aggregate changes in the economy.

Table 5 presents the classification of the Shaw series into higher and lower order goods. For this study, the lower orders refer to various durable and nondurable consumer goods which are assumed to represent the production and availability of consumer goods in the near future. The higher orders refer to capital intensive producer durables and construction materials which are assumed to represent the production and availability of consumer goods in the more remote future. Historical narratives described the particular boom industries as farming, building, steel, and consumer automobiles production (O'Brien 1997, 152-53; Payne 1942, 135-36; Pilgrim 1974, 280-81; Shideler 1957; 18, 35-36; Soule 1947, 86-89). The higher orders related to these industries are building construction, steel production, and long term investments related to farming and consumer

automobile production.³⁵ The individual goods related to these industries are also individually marked * in the various components of the Shaw series in Table 5. They are Motor vehicles & accessories in consumer durables for automobiles, Farm equipment & tractors for farming and Industrial machinery & equipment for steel in producer durables, and the entire construction materials index for buildings. In addition, the producer durables component minus Ships & boats will also be listed, for reasons mentioned below. Additional attention will be drawn to them when analyzing the movement of prices and production in the Shaw series during the postwar period, which are listed in Table 7. Based off of the three periods that describe this era, we will analyze relative changes in the composition of the yearly Shaw series from 1919-1920, 1920-1921, and 1921-1922.

³⁵ Although agriculture is not generally thought of a “higher order” stage, expansions in the higher orders of agriculture can still be made through long term land development, building expansions, and the production of agricultural machinery. The same can be said with regards to automobiles, as although they are consumer goods, the industry can still make long term investments.

Table 5: Shaw Commodity Output series, Components

Perishable Finished Commodities	Food & kindred, Tobacco, Magazines & newspaper, Drugs & bathroom, and Fuel & lighting
Semidurable Finished Commodities	Dry goods & notions, Clothing, House decorations, Shoes, Tires, and Toys
Consumer Durable Finished Commodities	Household furniture, Books, Luggage, Silverware & dishes, Tombstones, Heating & cooking tools, Electrical appliances, Radios, *Motor vehicles & accessories, Jewelry, Artificial limbs, House furnishings, and Musical instruments
Producer Durable Finished Commodities	Carpenter & mechanic tools, Office furniture, *Farm equipment & tractors, *Industrial machinery & equipment, Electrical equipment, Office equipment, Miscellaneous equipment, Motor vehicles, Aircraft, Ships & boats, Locomotives, and Scientific equipment
Construction Materials	Manufactured and Nonmanufactured

The annual nominal and real percentage changes for the various series are listed in order to gauge relative movements in prices and production. They are the aggregate series, the total higher and total lower orders, the higher and lower order components, and the individual series related to the boom industries.³⁶ Nominal series and not price indexes are given because what strictly matters for showing relative prices between the stages of production are cumulative prices. A relative rise in the prices of the higher orders

³⁶ The figures for the Shaw series can be found in Shaw (1947, 66-77). The total series is obtained by aggregating total finished commodities and construction materials. The total higher and lower order series are obtained by aggregating the higher and lower order components.

technically means a relative rise in the gross amount of money spent on goods in each of the higher order stages (Rothbard 2009, 518-522).

There are three important limitations that must be stressed. The first is that the Shaw series provides only yearly and not monthly figures, which is restrictive since the period under study is relatively short and as a result it will be more difficult to isolate the various stages of the business cycle.³⁷ The second is that there are significant wartime distortions from the end of World War I in November 1918 and dismantling of the wartime economy through 1919 that changed prices and production differently from what would have occurred through ABC alone. With regards to the Shaw series in particular, as will be explained below, there was an enormous buildup of Ships & boats during the war period and large dismantling after. The third is the existence of various positive and negative supply shocks during the boom and bust, in particular labor strikes and the resumption of European agricultural production, which also change price and production figures apart from the relative demand effects caused by an ABC. The limited data available for such a short period make it extremely hard to separate the various contributors. With these caveats in mind, we now proceed.

Section III: The Postwar Boom, March 1919 to January 1920

In the several years prior to the beginning of the boom in March 1919, the United States witnessed an enormous increase in the money supply and a drastic rise in prices.³⁸

³⁷ While the aggregate FRB index is available monthly, its components are only available yearly.

³⁸ For this paper all references to the money supply are to M2. The results do not noticeably change for broader aggregates. In addition, almost all increases or decreases in the money

Figure 4 shows this, which presents the money supply, prices, and New York Federal Reserve discount rate for the entire period of January 1915 to May 1923. This was due to World War I, which broke out in Europe on July 28th, 1914. From January 1915 to the end of U.S. neutrality when Congress declared war on April 6th 1917, the money supply increased 43.74% and producer prices rose 66.94%. Almost all of this was due to the massive gold inflow from Europe (Friedman & Schwartz 1993, 205). From the beginning of the U.S. entry into the war until the armistice on November 11th 1918, or in 19 months, the money supply increased 16.44% and producer prices rose 19.28%. As gold stopped flowing into the country, the increase was now due to the Federal Reserve's easy money policy to finance the war, at the behest of the Treasury, and its 1917 reduction in reserve requirements (Friedman & Schwartz 1993, 206-07, 211, 217, 220). During the war the Treasury issued four series of bond drives called Liberty Loans meant to be bought by the public in order to finance the war effort. The Treasury dragooned the Federal Reserve into indirectly financing the deficits by providing loans to banks at below penalty rates to buy their own bonds and to banks that had lent to the public to buy bonds. The Fed was reluctant, but Secretary Treasurer William McAdoo threatened to invoke the Overman Act, which would allow the President to give McAdoo control over the Fed (Meltzer 2003, 84-90). The Fed quickly reconsidered, and member bank reserves increased during this time by 108.98%, almost entirely from an increase in bills discounted. Overall, from January

supply during this period take the form of commercial bank deposits, not currency held by the public, so the components of the money supply are not reported. All money supply data is from Friedman & Schwartz (1970, 14-21), and all general producer price data is from BLS (2015a).

1915 to November 1918, the money supply increased 67.38% and producer prices rose 99.15%.

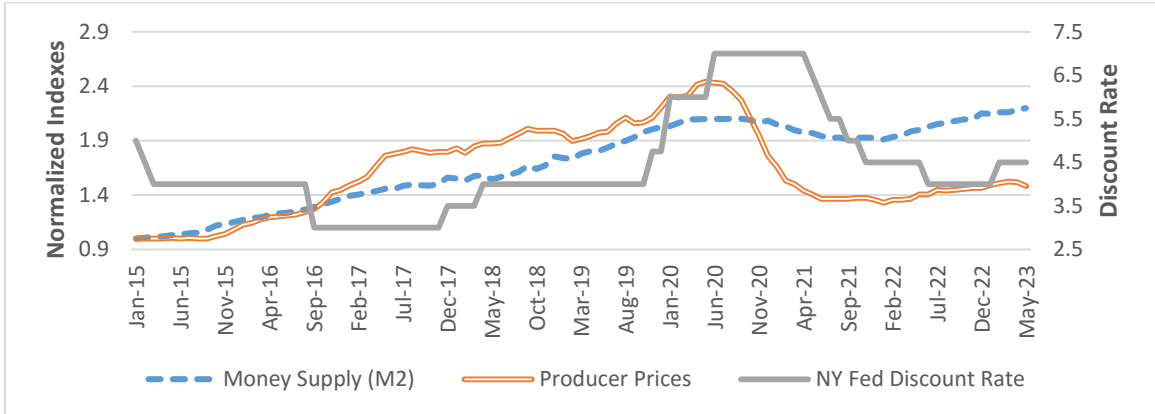


Figure 4

The war caused a short lived but drastic explosion in federal government spending, which in turn caused a drastic reconfiguration of the economy. As Table 6 shows, from FY 1916 (7/15 to 6/16) to FY 1919 (7/18 to 6/19), total government spending ballooned by 462.74%, and as a percentage of nominal GNP increased from 8.13% to 29.03%.³⁹ This was entirely due to the federal government's increase in defense spending, which shot up from 0.85% of GNP in FY 1916 to 21.79% in FY 1919. With this enormous explosion in government demands for war goods came a mobilization of the private economy away

³⁹ All government spending statistics are from Chantrill (2015).

from producing goods and services geared towards domestic consumption to one that produced war armaments.

Table 6: Total U.S Government Spending, Fiscal Years 1916-1922

Fiscal Year X (7/X-1 to 6/X)	Total Spending (change)	Total Spending as a % of Nominal GDP	Federal Spending (change)	Federal Spending as a % of Nominal GDP	Defense Spending (change)	Defense Spending as a % of Nominal GDP
FY 1916	-	8.13%	-	2.08%	-	0.85%
FY 1919	-462.74%	29.03%	1712.5%	23.84%	3909.30%	21.79%
FY 1920	-50.65%	12.69%	-63.79%	7.60%	-72.91%	5.23%
FY 1921	-7.06%	14.17%	-18.85%	7.42%	-36.61%	3.98%
FY 1922	-11.68%	12.54%	-31.76%	5.08%	-56.08%	1.76%
FY 1923	3.54%	11.16%	-1.06%	4.31%	-2.30%	1.47%

After the armistice and the end of the war, it was widely expected that there would be a postwar recession as the government drastically decreased its demands for war goods and soldiers returned home. With the end of the war there indeed was a massive decline as total government spending dropped by 50.65% from FY 1919 (7/18-6/19) to FY 1920 (7/19-6/20), equivalent to a fall as a percentage of GDP from 29.03% to 12.69%. Defense spending drastically receded, shrinking from 21.79% to 5.23% of GNP. Within four weeks of the armistice, the War Department cancelled 41.66% of its outstanding manufacturing contracts, which represented roughly 3.3% of GNP. Steel mills, which had experienced an enormous increase in business during the war, were now operating at 60-65% of capacity

(Grant 2014, 14). A minor recession did occur and in fact began in July 1918 according to Romer (Anderson 1979, 68-69; Friedman & Schwartz 1993, 222, Romer 1994, 592). Businessmen were anticipating that prices were going to fall during the recession and as a result postponed purchases, but the main uncertainty was by how much (Gordon 1974, 17; Slichter 1937, 6). From September 1918, which was the beginning of the price decline, to February 1919 producer prices dropped by 5.48% while pig iron production and automobile production fell by about 8% and 4% respectively (O'Brien 1997, 152).⁴⁰ Businessmen were expecting a great decline in prices and depression after the war as they thought the 99.15% rise in producer prices would be reversed, and this anticipation continued throughout the winter of 1919-1920. Even as late as February forecasters were predicting an imminent decline, as one business analyst stated "A period of trouble and depression is ahead. It cannot be sidetracked. We can prepare for reaction and prevent it from being disastrous, but to stop it is impossible" (Payne 1942, 8). However, the decline in government spending was not as drastic as assumed and remained at high levels and the Federal Reserve continued its easy money policy, so spending was kept up and prices did not fall that much (O'Brien 1997, 152). In total, from the beginning of the downturn in July 1918 to February 1919 the money supply increased by 9.04%, and from the end of the war in November 1918 to February 1919 by 3.47%, both sizable increases considering that the periods spanned only three to seven months. The 5.48% decline in producer prices would

⁴⁰ Precise aggregate output figures cannot be provided as the FRB index did not begin until 1919 and Shaw and GNP estimates are only yearly. From January to March, the FRB index did decline by 7.18%. Balke & Gordon's real GNP index does show a decline of 2.89% from 1918-1919, although it is uncertain how much of this can be attributed to the current recession. Unless otherwise noted references to GNP figures are from Sutch (2006b).

have been more severe in the postwar recession if the Federal Reserve had refrained from expanding. This correction would eventually come in 1920.

The Federal Reserve had continued its easy money policy after the war at the Treasury's orders. After selling four Liberty Loans during the war, the Treasury planned on selling a final Victory Loan in 1919. Although the Fed wanted to tighten after easing considerably for the past several years, the Treasury wanted to fund floating debt and keep bond prices of new securities high (Friedman & Schwartz 1993, 222). It was feared that if bond prices were to fall, which occurs when interest rates rise, there would be reduced confidence in the federal government and possibly a large sell off of securities (Weiher 1992, 31-32). The Fed grudgingly obliged after still feeling threatened by the Overman Act, although it would continue to prod the Treasury throughout the year to let them engage in contraction (Friedman & Schwartz 1993, 228; Degen 1987, 38).

By March and April businessmen realized that there was not going to be a severe depression and price fall in the near future, and optimism and business activity rebounded (Gordon 1974, 19; Grant 2014, 15; Payne 1942, 9). The boom of 1919 began. Its main feature was enormous speculative buying in commodities, securities, real estate, and industrial transactions (Aldcroft 1977, 76). Prices rose onwards and upwards, with producer prices rising 21.42% from February 1919 to January 1920. The main impetus behind the expansion was cheap credit (Aldcroft 1977, 67; Soule 1947, 94; Gordon 1974, 19; Persons 1922, 5). In the span of eleven months the money supply increased by 17.38%. Discount rates at the Federal Reserve banks remained stable throughout the year, the prominent one being New York's at 4%. Member bank reserves increased 14.43%, the

main increase coming from bills discounted. Interest rates on financial securities were likewise stable, as the rates on four to six month prime commercial paper and customer loans remained the same throughout the year.^{41,42}

The boom time economy swelled production orders and resulted in backlogs in various industries. Buyers would often place orders from multiple companies because they anticipated that only a couple would carry through (Grant 2014, 82-83). Continued rising prices made labor restless, and throughout 1919 one out of every five workers was involved in a strike (Grant 2014, 16). Labor strikes, railroad congestion, and shipping shortages lead to severe supply bottlenecks (Anderson 1979, 76; Aldroft 1977, 66). Crucial strikes in the input industries of steel and bituminous coal occurred in September and November of 1919 respectively and reduced output in industries that used these goods (Payne 1942, 136-38; Pilgrim 1974, 280-81). These adverse supply shocks contributed to the rise in prices of goods and raised the cost of production for businesses later in the year.

Table 7 presents the relevant structure of production statistics for 1919-1920. The Shaw series shows the industrial backlog as the nominal series increased by 12.05% while the real series was virtually stagnant at -0.04%. This is similar to the 12.97% rise and 2.12%

⁴¹ What matters for feeding an artificial boom in ABCT is not nominal interest rates but credit expansion (Mises 2008, 543, 789). In addition, most of the bank loans during this period were through discounting short term bills. Although the loans were short term, increases in long term investments can still occur and therefore generate an ABC. For example, increased credit in the form of financing short term inventory frees up a firm's funds for long term investments, which in the absence of credit expansion would have been used to finance the short term inventory (Machlup 2007 [1940], 236-61; Mises 2008, 750; Rothbard 2008, 77).

⁴² It is important to note that consumer borrowing was not yet important (Kuehn 2012, 159; Rothbard 2008, 93-94). Therefore, the credit that went to the private sector was lent to businesses.

fall in the nominal and real Balke & Gordon GNP series, and the 12.59% and 1.13% fall in the nominal and real Romer GNP series, as shown in Table 8. However, the composition of the series tells a different story. It is true that the total series for producer durables did decline in nominal and real terms (by 4.82% and 3.18%), and that overall the total nominal series for the total higher order stages increased less than the nominal series for the total lower order stages (by 11.06% as opposed to 12.36%) and the total real higher order series decreased more than the total real lower order series (by 0.07% versus 0.03%). This is attributable to the dismantling of the wartime economy, acutely shown in the Ships & boats component. From 1916 to 1919, the Ships & boats real series grew by an astounding 579.71%. This was due to the need to expand the Navy and ship soldiers and war supplies from North America to the Allies in Europe. With the war over there was no need for the ships anymore, and from 1919-1920 the real series declined by 40.02%, to 1922 by 90.50%, and then flatlined in the 1920s.⁴³ This sharp decline was a government induced phenomenon as the ships were produced to satisfy government demands that is separate from the effects caused by an ABC, which affects production geared towards private consumption.

⁴³ In November 1921 there was also the Washington Naval Conference whose purpose was to achieve a naval disarmament across multiple countries (Grant 2014, 137).

Table 7: Shaw Commodity Series, 1917-1920 (Growth Rates)

Nominal				
Industry		1919-1920	1920-1921	1921-1922
Total		12.05%	-31.48%	7.43%
Lower Orders	Total	12.36%	-28.38%	6.56%
	Perishable Finished Commodities	10.60%	-27.10%	0.26%
	Semidurable Finished Commodities	12.15%	-28.47%	12.11%
	Consumer Durable Finished Commodities <i>-Motor Vehicles & Accessories</i>	20.21% 23.27%	-33.25% -33.82%	24.04% 39.27%
Higher Orders	Total	11.06%	-41.36%	10.81%
	<i>-Total Net of Ships & Boats</i>	20.53%	-39.18%	14.52%
	Producer Durable Finished Commodities <i>-Net of Ships & Boats</i>	-4.82% 7.34%	-44.30% -40.33%	0.85% 7.65%
	<i>-Industrial Machinery & Equipment</i>	14.05%	-43.59%	17.60%
	<i>-Farm Equipment & Tractors</i>	-17.35%	-36.38%	-31.40%
Construction Materials		36.17%	-38.11%	20.71%
Real				
Industry		1919-1920	1920-1921	1921-1922
Total		-0.04%	-5.88%	16.24%
Lower Orders	Total	-0.03%	0.47%	14.85%
	Perishable Finished Commodities	1.85%	6.22%	4.02%
	Semidurable Finished Commodities	-7.54%	9.30%	19.38%
	Consumer Durable Finished Commodities <i>-Motor Vehicles & Accessories</i>	2.45% 9.35%	-24.64% -25.86%	52.90% 71.36%
Higher Orders	Total	-0.07%	-26.08%	22.23%
	<i>-Total Net of Ships & Boats</i>	5.30%	-23.50%	25.57%
	Producer Durable Finished Commodities <i>-Net of Ships & Boats</i>	-3.18% 5.27%	-38.73% -36.00%	22.70% 29.57%
	<i>-Industrial Machinery & Equipment</i>	8.60%	-40.16%	34.56%
	<i>-Farm Equipment & Tractors</i>	-6.13%	-49.66%	-8.46%
Construction Materials		5.35%	-5.83%	21.74%

Table 8: GNP estimates, 1918-1923 (% change from previous)

Year	Balke & Gordon		Romer	
	Real	Nominal	Real	Nominal
1919	-2.89%	10.78%	1.08%	3.58%
1920	-2.12%	12.97%	-1.13%	12.59%
1921	-3.52%	-16.01%	-2.36%	-16.77%
1922	7.18%	-0.38%	5.87%	0.06%
1923	13.99%	17.30%	13.23%	16.38%

When we net out the Ships & boats component, the nominal and real series for the higher orders (20.53% and 5.30%) increased much more than for the lower orders (12.36% and -0.03%). In general, the 1919-1920 boom fits the Austrian framework. Relative spending and production increased in the higher orders, but unlike with a fall in time preferences, spending and prices also increased in the lower orders. The credit expansion that had spurred on much of the postwar expansion fueled growth that could not be maintained. The drastic rise in spending is symptomatic of the reassertion of the public's time preferences with their enlarged money incomes. The structure of production was being geared towards producing higher order goods and providing for long term consumption, but the public wanted to increase consumption in the present. The structure was unsustainable and could not last.

The particular subdivision series for the prominent boom industries also show abnormal growth and malinvestments. The high 5.35% real and enormous 36.17% nominal

growth in construction materials, the latter the highest out of any series, reflects the burgeoning residential and commercial building boom at the time.

It is true that the combined Farm equipment & tractor real series fell, but this is because the industry peaked earlier in the year, so the yearly data from 1919-1920 do not show it, as it grew by an impressive 30.60% in real terms and 29.15% nominally from 1918-1919. In fact, the decline was entirely in the Farm equipment series, as from 1919-1920 the Tractor series still grew by an impressive 28.49% and 15.06% in real and nominal terms. The postwar situation in Europe and easy credit conditions led to an expansion in the higher orders related to agricultural machinery and land investment (Anderson 1979, 63-64; Pilgrim 1974, 275-76; Soule 1947, 86-89). In the postwar agricultural boom, prices of agricultural products rose and farmers expanded their productive capacity through improved tools and an expansion in building and land development (Shideler 1957, 35-36, 52; Grant 2014, 75-76). During this time there was also speculation and inventory accumulation of agricultural commodities as people expected that prices would rise (Shideler 1957, 37). New mechanization had occurred briefly before the war and continued during it, and the postwar marked the beginning of the phrase “Power Farming” when capital intensive methods of production such as tractors were adopted to improve productivity (Shideler 1957, 18). Farmers borrowed heavily from banks, using long term mortgage credits to improve farm land and buildings and short term credits for power farming (Shideler 1957, 52). Farmers took out multiple mortgages for land, and banks were eager to provide (Shideler 1957, 38-39). Extreme optimism led to the belief that the value of land was no longer connected to the value of what it produced, and as late as December

1919 some people believed it would never fall and possibly continue to rise (Shideler 1957, 39, Anderson 1979, 81). Throughout the year and into 1920 farmers took on increasing amounts of debt and increasingly borrowed in the short term to finance their operations.

The Shaw series shows large growth in consumer automobiles as Motor vehicles and accessories grew by 9.35% and 23.27% in real and nominal terms from 1919-1920, above the totals for the Consumer durables component. Production of cars more than doubled from February 1919 to February 1920 (Payne 1942, 196). There was also expansion in the higher orders of automobile production. The Ford Company announced the construction of a \$40 million blast furnace project at the beginning of 1920. In addition to this there was announced building construction in the automobile and related industries of \$60 million (Payne 1942, 195).

The steel industry also expanded to meet the increased higher order demands for farm machinery, building materials, and automobile parts. From 1919-1920, the Industrial Machinery & Equipment series grew by 8.60% and 14.05% in real and nominal terms. Total raw steel production grew by 21.21% from 1919-1920 (Atack & Bateman 2006). Farm implement manufacturers were one of the main buyers of steel that began the boom for the industry in June 1919 (Payne 1942, 136). The production of structural shapes, a crucial steel input used in the building and construction industry, rose by 26.50% as industrial building contracts grew (Atack & Bateman 2006, Payne 1942, 134). The doubling in automobile production throughout 1919 translated into higher demand for needed inputs, particularly steel sheet. The growth in cold and hot rolling mill facilities that produced steel sheet shows the expansion in the construction of facilities that make a higher

order steel input. In 1919 one cold mill and 22 hot mills were completed, while in 1920 87 cold and 83 hot mills were completed with 48 and 101 under construction (Payne 1942, 174-75).

Despite the roaring growth in several industries in 1919, the boom did not last. The main cause of the end can be attributed to rising interest costs and later monetary tightening. Before this, credit was bid away from the mortgage industry and residential construction turned downward by the end of summer, with commercial building following in November (Payne 1942, 202; Pilgrim 1974, 289-90). The stock market boom had similarly ended in November (Anderson 1979, 77). Throughout the year the Fed anxiously watched the economy overheat with prices rising, speculation increasing, and gold flow out of the country with reserves approaching the legal minimum. But at the end of the year the Fed was finally able to get approval from the Treasury to tighten, as the Treasury no longer wanted easy credit to maintain high prices of Liberty bonds (Pilgrim 1974, 285; Degen 1987, 33). The New York Fed raised its discount rate from 4% to 4.75% in November, and market interest rates, judging from the four to six month commercial paper and customer loan rates, similarly lurched upwards. The easy credit conditions and boom the Fed had created was now over. Rising interest rates and scarce credit had already turned some investments unprofitable in late 1919, and would continue to do so throughout 1920.

Section IV: The Postwar Depression, January 1920 to March 1921

January 1920 marked the end of the boom with the dip in the FRB index. After rising by 20.80% from February 1919 to January 1920, the FRB would slightly decline throughout the first half of the year until June by 3.82% before turning downwards

violently in the later half. Businesses faced increased costs of production and declining profits, and building construction continued to decline (Anderson 1979, 76). Businesses were heavily indebted to banks, and member banks were heavily indebted to the Federal Reserve (Anderson 1979, 76; Gordon 1974, 19-20). The Fed continued to tighten money, with the discount rate at the New York Fed jumping to 6% in January and then to 7% in June. From January until August the money supply rose 3.34%, a considerable decline in the rate of growth compared to 1919, while member bank reserves fell 3.3%. Prices continued to also rise throughout the year, with producer prices rising 5.88% from January until May. There were also a further adverse supply shock in the form of a railroad strike in 1920, an industry that already suffered from supply bottlenecks, which resulted in further congested supply routes and numerous delays that decreased supplies and raised prices of inputs (Anderson 1979 76, Pilgrim 1974, 281). The major collapse in prices began in midsummer, although price declines were uneven throughout the year (Grant 2014, 99-100). However, from May 1920 to March 1921 producer prices fell by an enormous 38.54%, which bottomed out in June 1921 for a total decline of 44.09%. The rising prices that began with WW1, with producer prices increasing from January 1915 to May 1920 by 144.06%, finally came crashing down. In addition to the downward pressure from the slowdown in the growth of the money supply from January to August, there was actually a 4.92% decline in the money supply from August 1920 to March 1921, which continued to fall until September for a total contraction of 8.88%, a fall that Friedman & Schwartz consider one of the worst on record (Friedman & Schwartz 1993, 232).

It is clear that there was a massive collapse in spending due to money demand rising and the money supply falling. Both Balke & Gordon and Romer's nominal GNP series show a decline of 16.01% and 16.77% from 1920-1921. Kuehn argues that Austrians mischaracterize the depression and concurrent fall in prices as a demand driven one when in reality it was caused by supply shocks, citing Romer (1988) and Vernon (1991) (Kuehn 2011 283, 289; Kuehn 2012, 159). However, Kuehn misunderstands these sources, because Romer and Vernon in fact argued that a positive supply shock *mitigated* the collapse in aggregate demand (Romer 1988, 109-110, 112; Vernon 1991, 579).⁴⁴ They argue that the severe aggregate demand shock would have been more problematic had a positive supply shock not occurred. Romer (1988, 110) argues that there was a positive supply shock due to the resumption of agricultural production and removal of trade congestion in Europe, building off the work of Soule (1947, 99-100). However, as Vernon (1991, 577) points out, this is still technically an aggregate demand shock transmitted through the net exports component. In addition, he also notes that prices declined outside of agricultural products, including in industries that did not use agricultural inputs.⁴⁵ Vernon (1991, 579) instead lists the resumption of labor peace and deflationary expectations as the beneficial supply shocks that cushioned the output effects of the demand shock.

The deflationary expectations argument is that participants knew that a severe postwar decline would follow the sharp run up during the war, and is used to explain the apparent flexibility of prices during the Depression of 1920-1921. These expectations

⁴⁴ See also Eichengreen (1992, 122-23), who argues along similar lines.

⁴⁵ Romer (1992, 764) seems to have revised her earlier explanation and no longer considers the supply shocks important. See Temin (1998, 50-51) on this issue.

existed because this was the traditional behavior of prices during and after wars. Under the classical gold standard, prices had been artificially pushed upwards during the war, and consequently they would fall freely downwards since the public realized that the rise in prices would not continue forever due to the hard rules of the gold standard.⁴⁶ In short, unlike other times, in 1920 the public had strong deflationary expectations. Prices were going to fall, and they knew it (Vernon 1991, 577-78).

However, this theory does not neatly fit the postwar period. As stated earlier, businessmen were expecting price declines during the short lived postwar recession from July 1918 to February 1919, but prices only moderately fell by 5.48% (Gordon 1974, 17; Slitchter 1937 6; Payne 1942, 8). After that, businesses figured that prices were going to start rising again for the foreseeable future, developed inflationary expectations, and started to speculate on the extent of the price rise by accumulating inventory at ever rising prices (Aldroft 1974, 66; Gordon 1974, 19; Grant 2014, 15; Payne 1942, 9; Persons 1922, 6; Soule 1947, 90).⁴⁷ Some businesses appeared to be completely blindsided by the collapse in prices mid-1920, as one contemporary maintained. Persons (1922, 6) quoted a clothing manufacturer in May 1920 who said “price cutting in clothing is mistaken and nothing

⁴⁶ Although the U.S did not officially go off the gold standard during WW1, it went off de facto by suspending dollar-gold convertibility and placing an embargo on gold exports. However the U.S did not let the dollar float. When the embargo was lifted at the end of the war, the U.S started to experience an outflow of gold, which would call for monetary tightening and a fall in prices to prevent going off gold. Thus, to the extent that the public believed the U.S government would stay on the gold standard, prices had to fall in the future (Bordo et al. 2007, 7,8).

⁴⁷ The significant speculation and buying of goods at rising prices to build up inventory that is described in many narratives of the boom attests to inflationary expectations. If businesses expected prices were going to be lower in the future, they would not buy inventory at rising prices but instead try to sell it as fast as possible before prices fell.

short of a nation-wide cataclysm could prevent prices next autumn averaging 30 percent above those of spring”, and maintained that this belief was not atypical for businesses.

A poll conducted in December 1919 for a boot and shoe industry association showed that although many producers expected price declines for raw leather inputs over 1920, many also expected price increases for their products. After the rude awakening, a speaker before the association in early 1921 said that no one in the industry thought “That deflation would come so soon, or be so drastic as it was, or honeycombed with so many complications” (Payne 1942, 66-67). When there were instances of deflationary expectations, such as by business analysts, they were too mild and as a result were surprised by the sharp and abrupt nature of the price drop. Following monetary tightening in December 1919, Harvard’s Monthly Survey of General Business Conditions (HMS) predicted that the process would be orderly and quickly be followed by monetary easing. In April 1920 HMS said “it does not seem probable...that liquidation in the near future will cause prices to fall below the level of a year ago and perhaps not below the level of November 1918 [15-20%].” However, in the wake of the 40% fall in commodity prices, an HMS forecast admitted that he and other forecasters “had not expected a (monetary) reaction of such acute severity. We had looked for a return [of commodity prices] to some such level as had prevailed in the few months following the armistice, and as late as July expected nothing so drastic as the events of the last half of the year.” Commodity price forecast errors (the realized price of the commodity minus the futures price) also showed that prices fell faster and harder than what was expected in 1920 (Bordo et al. 2007, 14-16). While there is evidence that the public correctly expected prices to stabilize and not

fall again by the same amount in 1921 and 1922, 1920 was not correctly anticipated in terms of timing and severity (Bordo et al. 2007, 9). Overall, it does not appear that there was a positive supply shock in the form of deflationary expectations at the beginning of the depression.

The sharp and unexpected decline in prices was concurrent with contractions in the real economy as the boom finally transitioned into a bust. Earlier estimates indicated that the decline in production was very large. The Department of Commerce GNP series lists real GNP as falling 14.29% during 1919-1921. The FRB index similarly falls 29.85% from June 1920 to March 1921. However Romer (1988) has argued that both series are too volatile and that real GNP only declined during 1920-1921 by 2.36%. Her arguments are convincing, and moreover, they correspond to the 3.52% decline in the real Balke & Gordon (1989) series. However, while this reduces the severity of the depression it does not make it inconsequential as the declines are similar to other recent U.S depressions. Thus the Depression of 1920-1921 was not unusually severe, but roughly as bad as other pre Great Depression downturns, at least judging by modern GNP estimates.⁴⁸

Microeconomic data also show real effects. Inventories took an enormous hit in value as producers who had gambled on ever higher prices suffered serious blows (Anderson 1979, 81; O'Brien 1997, 152; Grant 2014, 185-89). Bankruptcies of various businesses sharply increased and would remain at elevated levels throughout the 1920s.

⁴⁸ For Balke & Gordon's series, the 1890s (1892-1894 and 1895-1896) had a cumulative decline of -5.23%, 1906-1908 by -6.93%, and 1913-1914 by -7.57%. For Romer's series, the 1890s (1892-1894) declined by -1.69%, 1907-1908 by -4.17%, and 1913-1914 by -2.33%. Thus, while the 1920-1921 decline was never the most severe, it clearly fits in with previous experiences.

The failure rate per 10,000 firms steadily had declined since 1914-1915, the last significant U.S depression, to only 38 in 1919. In 1920 it rose to 49, and in 1921 and 1922 jumped to 102 and 119, with the average from 1923-1929 at 102. The average dollar value of current liabilities per 10,000 business failures in 1920 and 1921 was either the same or greater than any year of the Great Depression. The average decline in net income for 73 surveyed manufacturing firms from 1920-1921 was a brutal 75% (Sutch 2006c; O'Brien 1989, 727-78; O'Brien 1997, 152). International Harvesters' collapse in net profits mirrors this, as it fell from \$16 million in 1920 to \$4 million in 1921, or 75% (Ozanne 1968, 49). Average ex post real interest rates were higher from 1921-1922 than from 1931-1932, and the percentage change in debt burden from 1920-1921 was roughly the same as 1930-1931 and 1931-1932 (Ohanian & Cole 2000, 187-88; Gertler 2000, 243-44).⁴⁹ There was an increase in the number of bank suspensions, with the number rising in 1920 and tripling in 1921,

⁴⁹ The rise in the ratio of private debt to nominal GNP was greater in 1920-1921 than in any year of the Great Depression, using either the Balke & Gordon or Romer series for 1920-1921. Of course, the total rise in the ratio was higher in the Great Depression, and it should also be noted that this ratio was steadily falling from 1916-1920, while it slightly increased during 1922-1929 (James & Sylla 2006; Sutch 2006b; Sutch 2006d). These differences aside, it appears that there still was a strong debt burden during 1920-1921. Gertler (2000, 244) has remarked that the increased debt burden from the falling prices in 1920-1921 was not that serious because of the large rise in prices before the depression. If debt contracts were long term, then the fall in prices just counterbalanced the previous rise in prices and the value of the debt was eroded before the depression. See also Kuehn (2012, 159) who argues along similar lines. However, it appears that many debt contracts were short term and thus the fall in prices did constitute a true burden, at least judging from contemporaries. Keynes, borrowing from Fisher, argued that the most of the outstanding debt in the postwar era (using the prewar era as a benchmark) was contracted in depreciated dollars and was on average about one year old (Keynes 2008 [1923], 148-49; Grant 2014, 124-25).

but there was no general panic.⁵⁰ Total unemployment shot up, with Lebergott's estimates increasing from an abnormally low 1.4% in 1919 to 5.2% in 1920 and then 11.7% in 1921 (Romer 1988, 100).⁵¹

The structure of production clearly shows an uneven adjustment. The total Shaw nominal series plummeted by 31.48% in nominal terms and by 5.88% in real terms. The nominal series for the total net higher orders fell by more than the lower orders (39.18% versus 28.38%), and the real series for the higher orders drastically fell while the real series for the lower orders actually increased (-23.50% versus 0.47%). This is what one would expect in the bust phase of an ABC as the unprofitability of the higher orders relative to the lower orders is revealed and there are consequently much sharper declines in prices and production in the higher orders, even despite an overall nominal spending decline.

The boom industries predictably took a hit and bore a disproportionate amount of the burden. Some such as steel and automobile, continued production throughout 1920 by working off a backlog of orders in the face of declining demand (Payne 1942, 139-45, 199-200). Finally, at the end of 1920, they experienced a rude awakening, with declines massive

⁵⁰ This number would remain elevated and in fact increased in the 1920s before the Great Depression. Schwartz has remarked that bank suspensions in 1921, as opposed to 1930, were viewed by the public as special problems in troubled agricultural areas rather than a general loss of confidence in banks (Schwartz 1981, 45). However, there is also considerable evidence suggesting that many of the bank failures and panics in the early years of the Great Depression were a continuation of the trend in agricultural regions that had begun in the 1920s, and that many banks were insolvent and not just illiquid (Calomiris 2013, 192-97, 203).

⁵¹ Other unemployment estimates, such as Romer and Weir, show similar movements, although the volatility is not the same (Romer 1988, 100; Carter 2006). Lebergott has argued that neither of these series are superior to his for this period (Lebergott 1992, 382). For more on the unemployment problem, see Section V.

declines in prices, production, and decreases in inventory value (Grant 2014, 73-74, 156-63). The Shaw series shows this as Motor Vehicles & accessories declined in real and nominal terms by 25.86% and 33.82%, and Industrial Machinery by a punitive 40.16% and 43.59%. Farmers experienced a massive crush in their returns, with the price of ten leading crops falling 57% from July to December 1920, and continuing to plummet for a total 66% decline by June (Shideler 1957, 46). The 49.66% and 36.38% decline in the real and nominal Farm Equipment & tractor series, which continued to slide throughout the 1920s would be an unwelcome revelation to many farmers that the boom years of wartime were over. It is true that despite a sharp nominal decline of 38.11%, construction materials declined in real terms only by 5.83%. However this appears to be because the building trades were one of the first industries to revive, which Anderson attributes to a sharp drop in costs early in 1921 (Anderson 1979, 90-91).

From January 1920 to March 1921 neither expansionary fiscal or monetary policy was used. In fact, both were decisively contractionary. Although the drop in fiscal expenditures was not nearly as drastic as what occurred before the depression, total government spending dropped 7.06% from FY 1920 (7/19-6/20) to FY 1921 (7/20-6/21) and the federal budget continued to remain in surplus. The percentage of spending to nominal GNP did rise from 12.69% to 14.16%, but this was due to the larger drop in nominal spending overall.⁵² As before, the decline was entirely in federal expenditures and

⁵² Kuehn has noted that most of the decline in government expenditures from FY 1919 to FY 1922 came before the depression, and that Austrians should be careful when using fiscal years. Kuehn's 12 month moving average does not substantially change the results, so fiscal years are still used, but with greater care (Kuehn 2011, 2012).

in the defense component. The New York Fed's discount rate remained at a high 7% until May 1921, and from January 1920 to March 1921 member bank reserves declined by 10.56%. It is clear that, against the prescriptions of traditional economics, countercyclical policy was not used during this period of the depression.⁵³

However, this was not a *bane*, but rather a *boon* to the economy. Regarding fiscal policy, the reduction in government expenditures freed up money and resources, in

⁵³ There is some controversy over the applicability of "Keynesian" expansionary monetary and fiscal policies during the depression. Broadly, Kuehn has argued they were inapplicable because the economy was not characterized by demand deficiencies (Kuehn 2011, 283). However, as argued above, the economy was hit by a major drop in aggregate demand. Narrowly, Kuehn (2011, 278-81) argues that Keynes was largely in favor of the Fed's contractionary monetary policy in 1920-1921 as Keynes (2008) shows that he was a price level stabilizationist who advocated contraction to stop rising prices. While this is true, Keynes appeared to have only wanted to stabilize prices at the current level and not a return to the previous price level because this would be injurious to business. Tight money and high interest rates should be used when the economy is overheating and prices rising, but cheap money and low interest rates when the economy is contracting and prices falling (Keynes 2008, 38-40, 136-37, 142-44, 189). For more on Keynes' views see Selgin (1999). This is a sentiment shared by (proto monetarist) Fisher who said that the Fed's contractionary policy from mid-1920 onwards forced a "disastrous" fall in prices beyond what was necessary to stabilize them (Fisher 1934, 220, 222-23). See Friedman & Schwarz (1993, 237), Degen (1987, 39-40), and Weiher (1992, 34-37) for similar assessments. While tight money was appropriate at the end of 1919, it was not appropriate during the second half of 1920 up to mid-1921, at least according to Keynes and Fisher.

The call for expansionary fiscal policy (deficit spending and/or tax cuts) during this time is less universal, as Keynesian views on the matter were not fully elaborated until the 1930s and 1940s, and there is still debate among Keynesians over when to apply it. Kuehn (2011, 286) argues that Keynes advocated activist fiscal policy only when monetary policy is ineffective (e.g. the zero lower bound and a liquidity trap), which did not hold during this time. Regardless of whether this is true for Keynes, the merits of when to use fiscal or monetary policy regarding the Keynesian view as a whole have been debated over the years without being settled (Snowden & Vane 2005, 102, 108-112, 145, 364). The present writer finds it hard to believe that given the demand shock, traditional Keynesians would have not argued for some form of expansionary fiscal policy. See also Gordon (1974, 21-22), who argues in Keynesian fashion that stimulative fiscal and monetary measures should have been used.

particular, conscripted soldiers that were being used unproductively after the end of the war. Less private savings would be siphoned off into financing government deficits and instead could be directed towards industries geared on profit and loss accounting. The tight money and high interest rates helped purge malinvestments from the system and sped the return to a maintainable price structure.⁵⁴ The increased bankruptcy of firms, collapse in input prices, and liquidation of factors of production that occurred alongside and partly encouraged by the fiscal and monetary contraction is the healthy purging process that every economy must undergo in order to resume sustainable growth after a credit induced boom. Factors of production must be shifted from unprofitable lines of production to more profitable ones consonant with time preferences, and firms can resume production and absorb unemployed resources so when input prices (in particular, labor) sufficiently fall. By early 1921 this was being done, and the economy was poised for a comeback.

Section V: The Postwar Recovery, March 1921 to May 1923

From the depths of the 1920-1921 Depression the U.S economy rebounded and entered into “The Roaring Twenties”. In the Romer and Balke & Gordon series from 1921-1922 real GNP rose by 5.87% and 7.18% respectively and then during 1922-1923 by 13.23% and 13.99%. Lebergott’s annual unemployment estimates dropped from 11.7% in 1921 to 6.7% in 1922 and then to 2.4% in 1923. Similarly, the Shaw series grew in real terms from 1921-1922 by an enormous 16.24%, and then from 1922-1923 by 14.89%.

⁵⁴ Soule (1947, 111-12) discusses how the accounting illusion caused profitable ventures to appear unprofitable, but he does not comment on any unanticipated capital accumulation.

From 1921-1922 in the higher orders compared to the lower orders there was both higher real (25.57% versus 14.85%) and nominal growth (14.52% versus 6.56%), which signified a recovery in the form of increased investment in longer production processes. The Shaw series shows also the steel, building, and automobile industries roaring back that is described in the historical narratives (Grant 2014, 184-90).⁵⁵

What exactly explains the timing and the magnitude of the recovery from the Depression has generated significant controversy. Austrians argue that although resources would continue to be reallocated and input prices fall throughout 1921, by spring 1921 enough liquidation had already occurred for the economy to begin to grow again. Economic forces, without any help from government, promoted recovery from the depression by shifting resources from unprofitable malinvestments to more profitable projects. Anderson and Schumpeter, although not exactly adherents of ABCT, succinctly summarize this perspective. Wrote Anderson:

Businessmen and bankers both did a very thorough job in cleaning up the weak spots and in making readjustments in prices, costs, methods, and the proportions of industrial activity. By early spring 1921 the credit weak spots were mapped and charted. The banks knew what businesses could survive and what businesses must go under or at all events

⁵⁵ The Shaw series also shows the stagnation of farming described by Grant (2014, 190-91). Farming never recovered due to the flagging export market with Europe from the 1922 Fordney-McCumber protectionist tariff, which made it harder to Europe to sell goods to the US and earn an income in order to buy American farm exports (Anderson 1979, 102-03; Rothbard 2008, 138-39).

have a readjustment of their financial setup (Anderson 1979, 85-86).

Wrote Schumpeter:

[T]he reaction was sharp and unimpeded and, because it was sharp and unimpeded, relatively short. Prices and wages were allowed to drop drastically, liquidation of commodity stocks and debts proceeded rapidly, elimination of firms—over 8 percent of the manufacturing firms which were in business in 1919 had disappeared by 1921—was prompt...and the situation began to stabilize itself in April 1921...The case...shows better than any theory could how the system pulls out of troughs under its own steam and how it succeeds in doing so while [the] price level is still falling (Schumpeter 1939, 785-86).

Keynesians and Monetarists point to another factor, which was significant monetary expansion. After maintaining its discount rate at 7% for almost a year, the New York Fed cut it to 6.5% in May 1921, and continued to cut it to 4.5% by November, and cut it again to 4% in June 1922. Government securities and acceptance purchases also increased during this period. From its lowest point in September 1921 until May 1923, which was the start of the next downturn, the money supply increased by 14.85%, with member bank reserves likewise rising 20.17% due to the Federal Reserve's expansionary monetary policies (Newman 2016, 24-28; Rothbard 2008, 109-113). This either started the

recovery or substantially aided it (Kuehn 2011, 276, 284; 2012, 156, 158-59). Anderson and Schumpeter note the importance of monetary easing in their analyses (Anderson 1979, 95-99; Schumpeter 1939, 785-86).⁵⁶

Was the recovery due to an easy money policy within the purview of traditional economic prescription? Figures can be marshaled to support this interpretation. The Fed cut interest rates in May, and the traditional dating of the end of the depression was in July 1921. However, on closer inspection the argument is not so convincing. Figure 5 presents the relevant monthly figures.

⁵⁶ Interestingly, there is no comment on the expanding money supply in Anderson (1945) where he wrote that it was “Our Last Natural Recovery to Full Employment.” However in his later work he says it was important and writes that the Federal Reserve gave the economy a mild dose of strychnine which “did little harm and some good” (Anderson 1979, 99). It should be noted that Anderson was an adherent of the real bills doctrine.

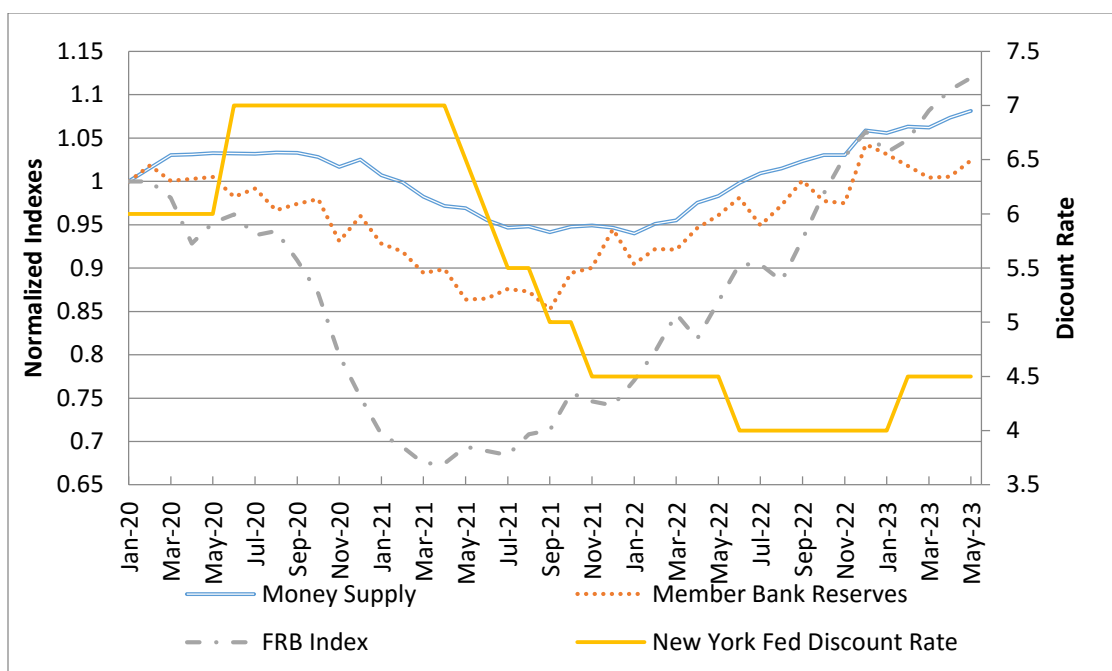


Figure 5

As Romer has argued, using the FRB index, the recovery began in March 1921. But the money supply continued to decline until September 1921, remained roughly stable for several months, and did not begin an upward trajectory until March 1922. Member bank reserves declined until September, then increased until December, but then slightly declined again. Overall, from March 1921 to March 1922, while the FRB industrial production index increased by 25.53%, the money supply declined by 2.78% and member bank reserves increased by only 3.01%.⁵⁷ It is clear that until early 1922, there was no

⁵⁷ As explained earlier, the FRB index may be overly volatile. To the extent that the index is overly volatile industrial production rebounded by less than 25.53%, but it also previously contracted by a smaller amount. There seems to be no other way until a more reliable index is constructed then to assume that the FRB index roughly captures the

money growth to stimulate a recovery. Afterwards from March 1922 to December 1922, the money supply increased 10.88% and the FRB index by 24.85%. Overall, from March 1922 to May 1923 the money supply increased by 13.22% and the FRB index increased by 32.2%. The extent to which this money-supply increase stimulated a recovery by boosting spending during 1921-1922 overall can also be questioned, as from 1921-1922 nominal GNP in both the Balke & Gordon and Romer figures changed by -0.38% and 0.06% respectively. It was only later that spending rocketed upwards as from 1922-1923 nominal GNP increased by 17.30% and 16.38%. The Shaw series does however show nominal growth of 7.34% from 1921-1922 before jumping to 18.90% from 1922-1923, but the yearly index may have been structured in such a way that it picks up growth later in 1922 than either of the yearly GNP series. Either way, the Balke & Gordon and Romer GNP indexes show strong real growth (7.18% and 5.87%) in the face of no nominal growth for some yearly portion of 1921-1922, which challenges the view that expansionary monetary policy was instrumental in jumpstarting the economy.

Can the recovery be attributed to expansionary fiscal policy? No, as total government spending declined by 11.68% from fiscal 1921 (7/20-6/21) to fiscal 1922 (7/21-6/22). Correspondingly, as a percentage of nominal GNP it fell from 14.27% to 12.54%.⁵⁸

underlying monthly trends in the economy (brisk recovery before an augmented money supply), although it overstates the expansions and contractions.

⁵⁸ The Harding administration did create a National Conference on unemployment headed by Herbert Hoover that tried to alleviate the unemployment problem by encouraging state and local governments to embark on public works. However it was not effective in this regard (Rothbard 2008, 189-94). As Kuehn (2011, 277, 284-85) points out, the Harding administration's influence during the Depression of 1920-1921 has been overblown. The

The recovery instead was brought about by the market reallocating resources. In particular, the recovery began in March 1921 as this was when firms began to cut nominal wages. The cut in nominal wages allowed businesses to lower their costs and boost their profitability, which allowed them to expand and absorb idle labor resources. Despite several months of falling prices from June 1920 onwards, firms had not yet cut wages. Nominal wages actually rose during 1920 despite the beginning of the depression, as average hourly earnings increased by 12.73% from January 1920 to September 1920 (NBER, 2012a).⁵⁹ The predictable result of abnormally high adjusted real wages brought about by the boom and further aggravated by the subsequent uncut nominal wages but falling prices was the large rise in unemployment during 1920-1921, with businesses shedding workers instead of cutting their price. However, starting in early 1921, firms began cutting wages. Some firms before this cut wages, such as in the Massachusetts textile towns in December 1920 (Grant 2014, 153). Out of a sampling of 12 large firms, the median month of the first wage cut was in February 1921 (Rose 2010, 856-857).⁶⁰ Based off 25 manufacturing industries average hourly earnings declined by 19.13% from

Harding administration can be applauded for cutting government expenditures at the tail end of the depression and during the recovery instead of saddling the economy with increased expenditures. However it can also be criticized for the enacting the disastrous Fordney-McCumber Tariff, foreign loan intervention, and encouraging the Federal Reserve to engage in expansionary monetary policies from 1921-1922 (Rothbard 2008, 119-21, 139-42). Overall then, the Harding's beneficial influence on the recovery is mixed.⁵⁹ Unfortunately, wage figures cannot be given for the boom years as the wage series start in 1920.

⁶⁰ It should be noted that Rose (2010) is a paper about the Great Depression, and the data on wage cuts in the 1920-1921 depression provided in order to be juxtaposed with data on wage cuts during the 1929-1933 Great Contraction in order to show that firms cut wages more rapidly in the former than in the latter.

December 1920 to December 1921. The decline was uneven, as in the agricultural implements and iron and steel industries wages fell by 32.50% and 37.09%, while in the boot and shoe and furniture industries, wages fell by 11.09% and 14.13%, and in the various printing industries they fell between 1.08-6.05% (Beney 1936, 56, 64, 104, 112, 140, 144). This corresponds to the need to reduce certain higher order input prices more than lower order prices after a boom. Businesses lowered their labor costs by cutting wages throughout the year.⁶¹

What matters for business profitability is the adjusted real wage rate (the laborer's nominal wage adjusted for the price of the produced output and its productivity). This gauges the average cost of a manhour of labor in relation to the average product it produces. During the boom adjusted real wages in the higher orders are bid up too high, which is recognized once the malinvestments are uncovered. In order to bring about recovery and reduce unemployment, the real prices of the misallocated labor and other resources must

⁶¹ There has been some controversy over the reliability of using AHE series because some have charged them with overstating nominal wage cuts. Regardless of whether this is true for AHE series in general, for this period 1920-1921 this does not appear to be true. Reliable records of actual nominal wages paid by businesses are scanty, but records do exist for an International Harvester plant in Chicago and a U.S Steel plant in Pittsburgh. After raising the common labor wage rate by 9.5% in February 1920, U.S steel cut wages by 20% in May 1921, which was followed by a 10% cut in July and a 20% cut in August, for a total fall of 40%. Most steel companies actually cut wages earlier than U.S Steel, with their first cuts in February (O'Brien 2000, 53; US Steel 1940, 182). Similarly, International Harvester raised the common labor rate by 11% in April 1920 and then cut wages by 20% in April 1921, and then followed this with a 12.5% cut in November 1921, for a total fall of 30% (Ozanne 1968, 41, 45-46). Since these roughly approximate the 32.50% and 37.09% series reported above, it seems reasonable to believe that the AHE series appropriately measures wage cuts for manufacturing industries in general. See O'Brien (2000, 54), who also argues that the AHE for steel fits well with their actual nominal wage cuts.

fall in the higher orders and reemployed in the lower orders. Firms need to cut their high costs by lowering nominal wages or increase the productivity of their workers (Rothbard 2008, 42-53; Vedder & Galloway 1997, 13-18). Figure 6 presents adjusted real wages and other pertinent indices.⁶²

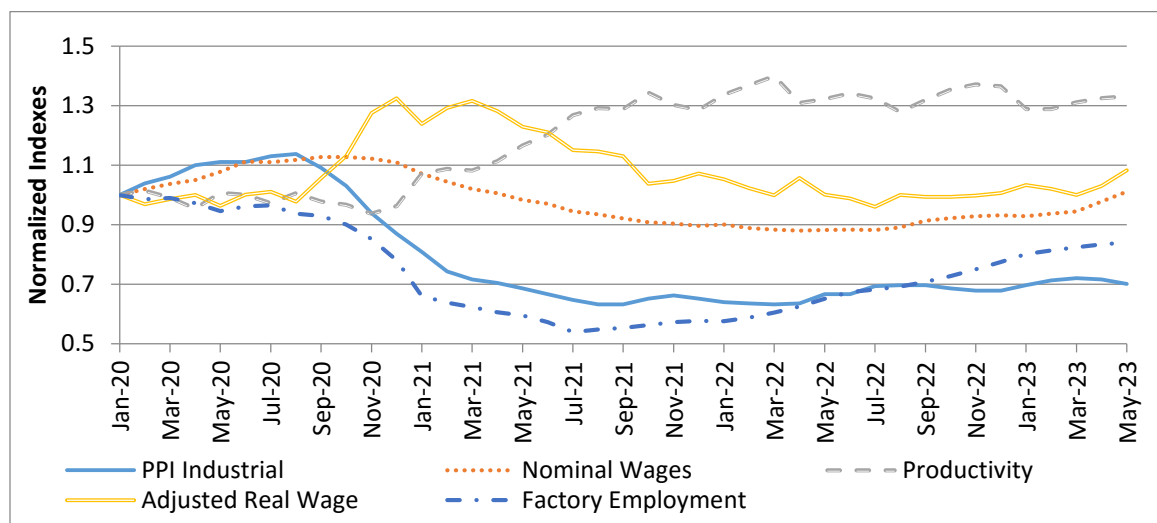


Figure 6

⁶² Figure 3 and the following analysis is the same as Vedder & Galloway (1997, 61-65), with the exception that the data is reported on a monthly instead of quarterly basis obtained by averaging the monthly data. For the data sources not reported so far, PPI for industrial commodities is taken from BLS (2015b) and factory employment for total durable goods is taken from NBER (2012b). As in Vedder & Galloway, labor productivity is approximated by dividing the FRB index by factory employment. The adjusted real wage is obtained by dividing the nominal wage (AHE) series by the producer price index, and then dividing this by the productivity index.

From January 1920 to September, the adjusted real wage and factory employment moved little. Nominal wages had risen, but so had producer prices. Afterwards until January 1921 producer prices fell precipitously, and since nominal wages had not fallen, the adjusted real wage jolted upwards and factory employment dropped. Then at the beginning of 1921 throughout the rest of the year nominal wages started to be cut. Although producer prices would fall in tandem so that the real wage only slightly fell, concurrently there was a large increase in productivity that continued throughout the year.⁶³ As a result, the adjusted real wage sharply fell until it was roughly at its early 1920s level by early 1922.⁶⁴ Although factory employment would continue to decline after the first round of wage cuts, the rate of decline sharply slowed down, and factory employment began to rise by July 1921. This explanation, that businesses started to grow again after they sufficiently cut their input costs and reallocated resources to more profitable ventures, is more convincing as an explanation for the recovery (as gauged by the FRB index) than monetary stimulus because the adjusted real wage rate was falling by spring 1921 while the monetary expansion did not increase the money supply until spring 1922, and moreover its overall effect on spending from 1921-1922 appears to be limited as well.

⁶³ Although some may say this productivity increase is a figment of the data due to the way the productivity index is constructed, several accounts of the Depression report an increase in labor productivity (Anderson 1979, 93-94; Gordon 1974, 22; Grant 2014, 200). Anderson reports that many new technologies and advances in labor efficiency were not utilized during the boom because of the industrial backlog. It should be also noted here that although factory employment does not reach the 1920 level by May 1923, that level should not be used as a benchmark for recovery because it did not reach that level again until the early 1940s.

⁶⁴ The productivity surge would have lowered the adjusted real wage less if it did not occur in tandem with cuts in nominal wages (assuming producer prices are still falling by the same amount).

This is not to deny that the monetary stimulus had some effect on the recovery, since from March 1922 to May 1923 the money supply did increase by 13.22% and prices and wages rose in 1922 and 1923. This is partly picked up by the 7.34% increase in the nominal Shaw series from 1921-1922 used to describe the structure of production in the recovery. But this marks the beginning of a new boomlet that caused the downturn of 1923-1924. Thus, to some extent the figures from 1921-1922 in the Shaw series are symptomatic of mini ABC, as nominal spending rose not only in the higher orders but also in the lower orders. However, far from contradicting the Austrian perspective this fits with its monetary interpretation of the 1920s, which points to the Federal Reserve's monetary expansion in the years 1922, 1924, and 1927. During each of these periods, the Fed was partly motivated to expand due to the incipient downturns in these periods. However, expanding the money supply to stimulate spending prolonged the adjustment process and ignited another boom (Rothbard 2008, 137-38, 153). From the 1927 expansion as well as from the earlier expansions that cut short recessionary corrections emerged the 1929 bust that marked the beginning of the Great Depression. The 1920s overall not only had sustainable time preference induced growth but also unsustainable credit induced growth (Rothbard 2008, xli). In this sense, Anderson is incorrect when he wrote that the recovery was the last natural one, since monetary stimulus did provide some readjustment from 1922-1923, but overall it seems clear that the market recovery would have continued on its own in the absence of

the expansion since recovery was well on its way before the monetary expansion kicked in.⁶⁵

Section VI: Conclusion

This chapter found that the Depression of 1920-1921 fits the Austrian theory. In doing so, it also has replied to critiques of this interpretation. It has been argued that the Austrian theory explains the boom and the necessary reallocations during the bust. After WW1, credit expansion was stimulated by the Federal Reserve at the orders of the Treasury, which artificially lowered interest rates. There was greater expansion in the higher orders than in the lower orders, with specific malinvestments and misallocations in the farming, building, steel, and automobile industries. The end of the boom was marked by the declining building sector and tight money by the Federal Reserve. The resulting bust, the Depression of 1920-1921, was shown to have been accompanied by a significant demand shock which economic orthodoxy would have combated with traditional countercyclical measures. However, the opposite occurred, and the downturn was marked by contractionary fiscal policies and for many months by contractionary monetary policies. These measures actually sped up the required reallocation process, and recovery in the traditional sense began roughly around March 1921, the same time firms began cutting nominal wages. The chapter also criticized the view that the recovery awaited expansionary

⁶⁵ Phillips, McManus, & Nelson (1937, 34-35) and Mazumder & Wood (2013) argue that there was not a sufficient amount of liquidation in 1920-1922 because the prices had not returned to their pre inflated levels. However, Rothbard notes that sufficient liquidation from a boom does not require price contraction back to those levels, but does suggest that not all of the malinvestments of the boom were liquidated during the Depression of 1920-1921 (Rothbard 2008, xli-xlii).

actions of the Federal Reserve. The money supply did not begin to increase until March 1922, well after the recovery began, and it appears that nominal spending overall increased very little during 1921-1922 and real growth rebounded before there was an increase.

The 1921 cycle resembles an earlier episode in which laissez faire policies likewise did not prolong the depression and recovery occurred without traditional countercyclical measures, namely the Panic of 1873 (Newman 2014). Future work might be done on other pre-Fed Depressions such as the 1890s, on the 1920s, and on the Great Depression, to see whether the Austrian perspective also has much to offer towards understanding them.

CHAPTER 3 EXPANSIONARY MONETARY POLICY AT THE FEDERAL RESERVE IN THE 1920S

Section I: Introduction

U.S macroeconomic policy during the Great Depression (1929-39) is one of the most well researched and discussed events in economic history. Economists place significant emphasis on the Federal Reserve's mismanagement of monetary policy during this period, and research has gravitated towards investigating whether the Fed's actions in the 1920s explain its subsequent behavior in the 1930s. With respect to the 1920s, there has been debate over what exactly the Fed's policy guideline was, its effects on the economy and the stock market, and if it consistently applied these rules into the early 1930s (Calomiris 2013, 166-67).

Austrian economists are not new to analyzing Federal Reserve monetary policy in the 1920s, as they have extensively commented on this period contemporaneously as well as in the 1930s and the post-World War II period. Along with others, they saw the increase in the money supply and credit expansion as largely engineered by the Fed, which created a boom that led to the subsequent stock market crash and initial downturn. Proponents of this viewpoint held something like a Mises-Hayek Austrian Business Cycle Theory (ABCT) of boom and bust, which states that when the central bank expands credit, it artificially lowers interest rates below their natural levels, causing an unsustainable boom

that inevitably turns into bust (Mises 1966, 548-66). The expansionary, or “Inflationist” camp is best represented by Rothbard (2008a [1963]), who largely built off of older writers who held a similar opinion, mainly Anderson (1979 [1949]), Phillips, McManus, & Nelson (PMN) (2007 [1937]), and Robbins (2007 [1934]).⁶⁶

On the other hand, there is a diametrically opposed interpretation of 1920s monetary policy. Researchers in this tradition say that the increase in the money supply was not due to expansionary monetary policy as the Fed mostly “sterilized” gold inflows and was therefore contractionary. There was no unsustainable boom and the period was one of remarkable stability (as shown by the strong growth and mostly stable price level). The contractionary, or “Deflationist” camp is best represented by the Monetarists Friedman & Schwartz (1993 [1963]), who built off a different set of earlier writers and have largely influenced modern monetary interpretations of the 1920s such as Meltzer (2003), Timberlake (1993), and Wheelock (1992).⁶⁷ Particularly important is that Rothbard and

⁶⁶ The Austrians defined inflation differently than the modern definition (a rise in prices). For the Austrians, inflation has generally been defined as an increase in the money supply that leads to a rise in spending; the rise in prices is an effect of the underlying inflation. The significance of this is that inflation can still occur if prices remain stable or slightly fall. This is because increases in the money supply generally take place alongside large increases in production. While the augmentation of the money supply increases the demand for goods and raises prices, it gets counteracted by the increase in the supply of goods, which offsets the increased supply of money to gently push down prices. What matters though is that if the money supply did not increase at all, prices would have fallen much more. The 1920s is a perfect example as consumer prices were mostly stable despite a rapid expansion of output. In order to avoid confusion on the definition of inflation (and consequently deflation), the present paper will instead conform to the modern definition and characterize the Federal Reserve’s actions as either expansionary (increasing the money supply) or contractionary (decreasing the money supply). For more, see Rothbard (1963, 84-86, 169-71), Robbins (1934, 48-49), and Selgin (1997, 55-57).

⁶⁷ Proponents of a “neutral” policy would also be classified in this group.

Friedman & Schwartz and their followers never explicitly discussed the respective differences in their interpretations of 1920s monetary policy.⁶⁸ The result has been two diametrically opposed views, both of which have heavily influenced researchers working in each tradition.⁶⁹ The main motivation of this chapter is to explicitly compare them and show that one of them is the correct interpretation.

This chapter sides with Rothbard (1963) and the earlier writers as opposed to Friedman & Schwartz (1963) and later monetary historians. The argument here is not that the Federal Reserve's policies caused a business boom that inevitably led to the stock market crash and depression, as the Expansionist camp also tries to do, nor does it provide an in-depth description of the motivations that guided the actions of the Federal Reserve. It also does not discuss monetary policy during the Great Depression and compare the Fed's actions between the two periods. Rather, all it tries to show is that the Federal Reserve engaged in expansionary monetary policy during the 1920s and was responsible for the increase in the money supply through an increase in the money multiplier and total bank reserves.

⁶⁸ Except for the discussion between Salerno and Timberlake. For more, see below.

⁶⁹ A recent example that briefly discusses the divergent Austrian and Monetarist interpretations of 1920s and 1930s monetary policy is Irwin (2014). Since Irwin's focus is on writers in the interwar period, he only briefly mentions Friedman & Schwartz (1963) and instead focuses on Cassel, Hayek, and Keynes. Irwin notes that contra to Cassel, who argued that the Federal Reserve's contractionist policies in the 1920s caused the Great Depression, Hayek argued that the Federal Reserve was in fact expansionary and generated an unsustainable boom that caused the initial downturn. While informative of respective viewpoints, Irwin's discussion does not go into an in depth analysis of monetary aggregates in order to reconcile their differences (Irwin 2014, 219-22). I am indebted to Thomas Hogan for this source.

The former was mainly due to the Fed lowering its reserve requirements on time deposits relative to demand deposits in the 1910s which incentivized banks to shift their deposits from demand to time. The increase of total bank reserves, which took the form of an increase in member bank reserves, was not due to an increase in the monetary gold stock which the Fed failed to completely offset, but rather mainly due to an increase in the Federal Reserve's *controlled* factors of increase in the 1920s, consisting of all Federal Reserve Credit with the exception of bills repaid into the system. The increase in the money supply was mostly due to the increase in total bank reserves rather than the rise in the money multiplier. The chapter argues that Federal Reserve credit does not faithfully reflect Federal Reserve policy because bills repaid were an uncontrolled factor of decrease into the system due to the below-market penalty rate and the de facto allowance of continuous borrowing at the discount window, which meant that banks were the ultimate decision makers about when to reduce their indebtedness.

Showing that the Fed caused a significant credit expansion provides a useful stepping stone for future ABCT research. As those who want to show that the Fed created an unsustainable boom in the 1920s must first show that the Fed promoted credit expansion, this chapter advances this thesis by establishing that the Fed was in fact responsible for the increase in the money supply. However, the actual application of ABCT that shows the credit expansion's distortive effects is not described in this chapter and instead left to future research.

The chapter is structured as follows. I first provide a brief literature review on interpretations of Fed monetary policy in the 1920s, with particular emphasis on the

differences between the two groups noted earlier. Then I describe the increase in the appropriate money supply figures and assign quantitative weights to the two factors that drove the increase, which were the increase in the money multiplier and the increase in total bank reserves. The following section analyzes these forces and shows that they were largely due to Fed policy. I then offer a short conclusion.

Section II: Literature Review

Simply put, the number of scholarly works that have been written on 1920s and early 1930s monetary policy over the past 90 years, either directly or indirectly, is enormous. The following literature review does not attempt to summarize nearly all of the information and discussions surrounding it but rather highlights the doctrinal filiations of the two groups, particularly the Expansionists, their influences (or lack thereof) in the literature, and any discourse between them.

As stated earlier, the first group is most ably represented by Rothbard (1963), who provided the most complete study of an expansionary Federal Reserve in the 1920s, an argument that he continued to promote in later works (1976, 2008b [1983], 1984, 1998, 2005). Rothbard was heavily influenced by the works of Anderson (1949), PMN (1937), and Robbins (1934), which he considered for the period to be the “only really valuable studies” (Rothbard 1963, xlii).

Intertwined with a full blown analysis of early 20th century economic history, Benjamin Anderson (1949) sharply criticized 1920s Federal Reserve policy. Along with H. Parker Willis, another contemporary critic, Anderson charged the Fed with engaging in excessive and disastrous operations, a thesis he developed in earlier 1920s articles. PMN

(1937, vii, 82) considered Willis and Anderson the most knowledgeable contemporary economists on monetary policy and built off their work.⁷⁰ Rothbard held a similar opinion and thought of them as “eminent economists” who along with the Austrian economists perceptively criticized the Fed in the 1920s (Rothbard 1963, 76).⁷¹ Ludwig von Mises lauded Anderson’s 1920s criticism and considered his historical study “a great book” (Mises 2008 [1950], 90-94).

Anderson and Willis, both of whom were advocates of the Real Bills doctrine,⁷² voiced their criticisms alongside Austrian economists. The most prominent 1920s Austrian critic was F.A Hayek, who charged the Fed with engaging in price stabilization, i.e., deliberately increasing the money supply to offset falling prices. The idea concerned not only his policy analysis (Hayek 1999 [1925]; 1999 [1932]) but also his theoretical work.⁷³ Lionel Robbins, then an Austrian economist affiliated with Hayek, developed an in-depth criticism of Federal Reserve monetary policy from an Austrian perspective (Robbins 1934). He said that the Fed caused a business cycle through its expansionary policies in the late 1920s, which were designed to help Great Britain return to the gold standard. Rothbard was heavily influenced by Robbins’ discussion of this motivation and his theoretical

⁷⁰ For samples of their contemporary articles, see PMN (1937, 82, 258, 269). For more on Anderson and Willis see Skousen (1993, 262-64).

⁷¹ Rothbard also had particularly high praise for Willis (Rothbard 1998, 161).

⁷² The Real Bills doctrine held that banks could not engage in expansionary policy as long as loans were made for “real” goods and not for “financial” transactions such as the stock market. Rothbard’s praise was restricted to their monetary analysis as he sharply criticized their theory (Rothbard 1963, 75-80).

⁷³ Hayek (2008 [1933], 4) cites a list of his studies, including the above, that dealt with price stabilization. See White (1999, 110) for more information. For an analysis of Hayek’s theoretical work on price stabilization in relation to his contemporaries, see Selgin (1999).

application of ABCT, which he considered “unquestionably the best work published on the Great Depression” (Rothbard 2010 [1959], 289).

While his praise for Robbins’ work was high indeed, the book that undoubtedly influenced Rothbard’s monetary analysis the most was PMN (1937). Along with Anderson and Willis, PMN built off of Hayek and charged the Federal Reserve with engaging in a deliberate policy of price stabilization, among other motives, and trenchantly criticized its expansionary actions throughout the decade. Their analysis of time deposits and member bank reserves is clearly seen in Rothbard’s writings,⁷⁴ and he considered the book an “important but totally neglected work” (Rothbard 1962, 111).⁷⁵ Rothbard used the three major studies described above, among others, to develop the thesis that “the great inflationary boom of the 1920s...rests upon the federal government-[primarily] the Federal Reserve authorities” (Rothbard 1963, 167).

Rothbard’s thesis was not shared by other contemporaries.⁷⁶ In the same year the book came out, Friedman & Schwartz (1963) was published, which became an enormously popular book on monetary history. Analyzing topics not only on interwar monetary policy, the book spanned over much of the United States’ monetary history (1867-1960) and included studies on the period of greenback resumption (1867-79), various late 19th and early 20th century banking panics (e.g., 1893 and 1907), and WWI and II financing. It had

⁷⁴ Anderson (1949), though less so, can be included in this. For the similarities in analysis, see below.

⁷⁵ Selgin (1997, 55) has similarly characterized it as a “fascinating, but sadly overlooked, ‘relative inflation’ perspective.” For a similar opinion, see Higgs (2009).

⁷⁶ Most reactions to the book as a whole were negative (e.g. Smolensky 1964). The few exceptions included the older writers he used, such as Mises (1966, 558) and Hayek’s favorable comments (Gordon 2009).

widespread influence on both theoretical and empirical monetary discussion, and is undoubtedly one of the most important macroeconomic books of the 20th century (Bordo 1989; Bordo & Rockoff 2013).

Their most influential thesis is that the Great Contraction (1929-33) was caused primarily by the collapse in the money supply and the original recession was caused by tight monetary policy in the late 1920s. The rest of the 1920s however was one of remarkable performance of monetary management and outstanding economic stability, and “the Reserve System, far from being an engine of inflation, very likely kept the money stock from rising as much as it would have if gold movements had been allowed to exert their full influence” (Friedman & Schwartz 1963, 298).⁷⁷ Rather than causing an expansion of the money supply, the Fed in fact was contractionary. The works that heavily influenced their arguments were different than Rothbard’s and were the “especially noteworthy” studies of Burgess (1927), Riefler (1930), Reed (1930), and Hardy (1932) (Friedman & Schwartz 1963, 241). And their thesis on the Federal Reserve’s contractionary gold sterilization has strongly impacted later monetary historians’ analyses of the period (Meltzer 2003, 257-58; Timberlake 1993, 262; Wheelock 1992, 14).⁷⁸

However, their 1920s monetary analysis has not gone without criticism. On Fed motivations, they explicitly sided with Hardy (1932) and denied any significant international considerations for policy actions (Friedman & Schwartz 1963, 269). Wicker (1965, 1966) dissented, arguing that foreign policy was the overarching motivation, while

⁷⁷ Also see Friedman & Friedman (1990 [1980], 78).

⁷⁸ Both Meltzer (2003, xiii) and Timberlake (1993, xxi) also praised Friedman & Schwartz’ work as being integral to their studies in general.

Brunner & Meltzer (1968) said that it was not.⁷⁹ Notwithstanding these criticisms, the widespread acceptance of their work cannot be denied.

After both Rothbard (1963) and Friedman & Schwartz (1963) came out, there seems to have been little discussion between the two groups over their divergent viewpoints.⁸⁰ Rothbard and the earlier works were barely mentioned in later monetary analyses of the 1920s,⁸¹ and the Friedman & Schwartz view remained dominant. More recently, however, there has been discussion among the groups. In a series of articles on 1920s and 1930s monetary policy Timberlake (1999a, 1999b, 1999c) also criticized Rothbard's interpretation of monetary aggregates, and was responded to by Salerno (2010a [1999]). Part of the argument centered over whether the Federal Reserve engaged in expansionary or contractionary practices in the 1920s, but unfortunately this was not the

⁷⁹ Another important contention was whether or not the Fed executed a consistent policy throughout the 1920s or 1930s, or if the death of Benjamin Strong marked a noticeable divergence. Friedman & Schwartz maintained that the death of Strong was crucial, while later research argued to the contrary. See Wheelock (1991, 5-6) for more information on both disputes.

⁸⁰ It has been particularly hard to find any verified discussion between Rothbard and Friedman over their divergent viewpoints on the 1920s. Rothbard (1990) recalls an argument with Friedman that apparently dealt with his book. The bitterness of their disagreements over the period must have certainly led to their falling out and contributed to their caustic opinions of each other. Around this time Rothbard wrote some brief critiques of Friedman & Schwartz' 1920s analysis, but these were not substantial (Rothbard 2008a [1972], xxxiii-iv; Rothbard 2011 [1971], 905-06).

⁸¹ In the 1960 and 1970s when Rothbard and the others were cited, it was usually done by fellow Austrians (e.g. Sennholz 1969). Non Austrians include a brief citation by Kindleberger (1973). More recently, Eichengreen & Mitchner (2004) and Bordo & Landon-Lane (2014) have cited Rothbard as an expositor of the Austrian interpretation of the 1920s inflationary boom. Though neglected by economists, Rothbard's analysis was used by some historians (e.g. Johnson 1997).

centerpiece of discussion in later replies (Timberlake 2000a, Salerno 2010b [2000], Timberlake 2000b).⁸² Their substantial disagreements are important for the monetary analysis of this chapter and are referenced later in the chapter.

Section III: Monetary Figures

This section briefly goes over the increase in M2 and its the specific components, as well as annual changes in the money supply and the reasons for its increase.⁸³

⁸² More recent works are Toma (2013), who surveys both sides of the literature and ends up disagreeing with both interpretations, and Herbener (2014), which engages in an in depth Austrian analysis.

⁸³ The M2 definition includes all currency in the hands of the public and demand and time deposits at member and nonmember commercial banks. Rothbard argued for a broader definition of the money supply that included time deposits at savings banks and savings & loan shares (M4). He also included life insurance liabilities, but later separated money supply figures to exclude them and then dropped them (Rothbard 1984, 119; 1998, 120, 159). While I agree with the M4 definition, for the sake of argument it is not used as it is not directly related to the main argument that the Federal Reserve was expansionary. Further studies that try to apply ABCT to the 1920s will need to show total credit expansion and consequently should incorporate it. For a defense of the broader definition, see Rothbard (1963, 87-91; 1978; 1983, 252-61) and Salerno (2010c [1987]).

Table 9: Total Money Supply of the United States, June 1921 to June 1929 (in billions of dollars)

Date	Currency	Demand Deposits	Time Deposits	Total Money Supply	Percent Change
June 1921	4.07	17.09	11.30	32.46	-
June 1922	3.66	18.18	12.07	33.91	4.47
June 1923	4.02	18.85	13.82	36.69	8.20
June 1924	3.97	19.50	14.86	38.33	4.47
June 1925	3.95	21.65	16.43	42.03	9.65
June 1926	4.00	22.31	17.56	43.87	4.38
June 1927	3.98	22.06	18.70	44.74	1.98
June 1928	3.95	22.05	20.22	46.22	3.31
June 1929	3.94	22.47	19.86	46.27	0.11

Adapted from Rothbard (1963, 92). Data is from Friedman & Schwartz (1970, 18-25)

Table 9 shows the various components of the money supply, including its total and annual change from the previous year from June 1921 to June 1929. The timeframe is chosen because the Depression of 1920-21 is generally thought to have ended around July 1921 and the Great Depression began around July 1929 (Rothbard 1963, xli-xlii, 91; Sutch 2006). Figure 7 plots these last two components over the entire period. From June 1921 to June 1929 the total money supply increased 42.54%, or a per annum rate of 4.53%. However, the growth was not even but instead took place in bursts: particularly June 1922 to June 1923 and June 1924 to June 1925. The latter half of the decade had overall lower growth rates with June 1927 to June 1928 as the highest period. The growth in these three timeframes will be shown to have been closely related to the movement in member bank reserves. The expansion was also uneven in terms of the various monetary components: currency in circulation fell 3.19% and total bank deposits increased 49.10%. Bank deposit

growth was similarly unequal as demand deposits grew only by 31.48% while time deposits grew 75.75%.

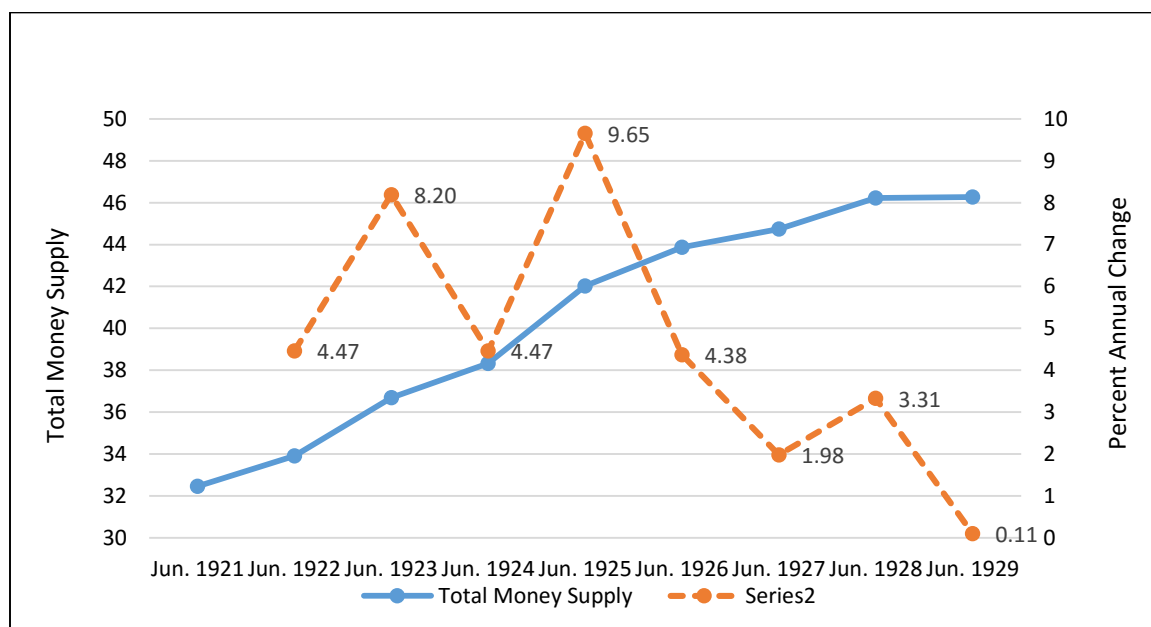


Figure 7: Total Money Supply, June 1921 to June 1929 (in billions of dollars)

The total money supply in the economy can be represented by the simple formula:

$$\text{Money Supply (MS)} = \text{Currency} + (\text{total bank reserves} \times \text{MM})$$

where MM (*money multiplier*) = $\frac{1}{\frac{RR}{D} + \frac{ER}{D}}$. $\frac{RR}{D}$ is the ratio of required reserves to deposits

and $\frac{ER}{D}$ is the ratio of excess reserves to deposits. The last ratio can be ignored since excess

reserves in the 1920s were minimal (Rothbard 1963, 96), and so MM simplifies to

$\frac{1}{\text{reserve requirement}}$. This simple money supply formula is preferred over the other money

supply formula $MS = MM * H$ that uses the “monetary base” multiplier $MM = \frac{1 + \frac{C}{D}}{\frac{C}{D} + \frac{RR}{D} + \frac{ER}{D}}$,

where $\frac{C}{D}$ is the ratio of currency to deposits and H (*high powered money*) = *total bank reserves + currency*, which is also known as the monetary base.

The reasons for doing this is because the former clearly demarcates controlled (the Fed) from uncontrolled (the banks and the public) influences on the total money supply. Aside from simple currency expansion, the formula explains that growth in the money supply comes through changes in either bank reserves or the money multiplier. Both bank reserves and the money multiplier can change for controlled or uncontrolled reasons. For the money multiplier, the controlled reason is a change in reserve requirements from the Fed, while the uncontrolled is from banks changing their excess reserves. For member bank reserves, the uncontrolled factors are changes in currency in circulation and the monetary gold stock, while controlled are changes in Federal Reserve assets purchased and bills discounted. The former formula appropriately depicts the Fed’s influence, as changes in controlled and uncontrolled factors can be neatly shown through changes in the money multiplier and bank reserves. On the other hand, the latter formula includes the currency deposit ratio ($\frac{C}{D}$) and high-powered money (H), or the monetary base, which obfuscate the proximate determinants of changes in the money supply since they both include controlled and uncontrolled factors. Other things equal (currency held and reserve requirements), an increase in reserves from the Fed that increases deposits is partly shown as a fall in ($\frac{C}{D}$) and

attributed to the public (uncontrolled) even though the primary impetus came from the Federal Reserve (controlled).⁸⁴ Bank reserves, and not the monetary base, should be the focus since the latter includes vault cash and currency in circulation. Since a change in its composition indirectly impacts banking reserves, the monetary base can remain the same alongside expansionist or contractionist pressure on the money supply. Movements in the monetary base are unilluminating; what matters is its composition, or specifically alterations in total banking reserves (Rothbard 1983, 258).⁸⁵

Since currency in circulation did not increase in this period, the increase in the money supply was due to the increase in total bank reserves and in the money multiplier. Table 10 shows the changes in total bank reserves, total member bank deposits, and the money multiplier for member banks at the Federal Reserve. Changes in member bank reserves and the money multiplier are used to roughly gauge weights for total monetary expansion because nonmember banks pyramided off of member banks.⁸⁶

⁸⁴ For the misleading nature that $(\frac{C}{D})$ shows for this period, see footnote 87.

⁸⁵ I am indebted to Joseph Salerno for his helpful comments on the differences between the two multipliers.

⁸⁶ Vault cash is excluded from total bank reserves as from 1917-59 vault cash could not be used to meet the Federal Reserve's reserve requirements (Friedman & Schwartz 1963, 194). Banks could not expand credit off of them and instead they were used only to satisfy deposit withdrawals.

Table 10: Bank Reserves, Bank Credit, and the Money Multiplier, June 1921 to June 1929 (in millions of dollars)

<i>Date</i>	<i>Member Bank Reserves</i>	<i>Member Bank Deposits</i>	<i>Deposit to Reserve Ratio</i>
June 1921	1.604	18.389	11.46 to 1
June 1925	2.172	25.448	11.71 to 1
June 1929	2.356	28.947	12.28 to 1

The calculations for Table 10 are as follows. The money multiplier has been written in the form of “deposit to reserve ratio”, or numerically “X to 1”. It is the total amount of money banks can create in the aggregate with their given reserves. It is Member Bank Deposits divided by Member Bank Reserves. The rationale for the weights in the various periods (June 1921 to June 1925, June 1925 to June 1929, and June 1921 to June 1929) are shown according to the following example: For June 1921 to June 1925, multiply the final reserve figure (\$2.172 million) by the original money multiplier (11.46). The total is 24.891. This is the amount of money that would have been created (instead of 25.448) if the money multiplier did not change, meaning that the change in the money multiplier accounted for the difference (0.557). In other words, out of the 7.059 of new money (25.448-18.389), 7.89% (0.557/7.059) was due to the money multiplier and thus 92.11% to the increase in bank reserves. For the rest, see below:

June 1925 to June 1929: $2.356 \times 11.71 = 27.588$. $28.947 - 27.588 = 1.359$. $1.359 / (28.947 - 25.448) = 38.84\%$. $100 - 38.84 = 61.16\%$

June 1921 to June 1929: $2.356 \times 11.46 = 26.999$. $28.947 - 26.999 = 1.948$. $1.948 / (28.947 - 18.389) = 18.45\%$. $100 - 18.45 = 81.55\%$.

Adapted from Rothbard (1963, 102). Data from Friedman & Schwartz (1970, 305-08) and Board of Governors (1943, 347-75).

Overall, from June 1921 to June 1929 member bank reserves increased by 46.88% and member bank deposits by 57.41%. During this period the increase in the money multiplier accounted for 18.45% of the increase in bank credit, while the increase in reserves accounted for 81.55%. Both were due to controlled influences. The first was due to the decrease in relative reserve requirements on time deposits compared to demand deposits at member banks, while the second was due to an increase in member bank

reserves from an increase in the Federal Reserve's controlled factors of increase (which worked with the higher money multiplier). These are explained in the following sections. Compare these results to the monetary base multiplier estimates, where from July 1921 to August 1929 the decrease in the currency to deposit ratio accounted for 54%, the fall in the reserve to deposit ratio 15%, the increase in high powered money 27%, and the rest as the interactions between the ratios (Friedman & Schwartz 1963, 274).⁸⁷

Returning to the simple formula, the 46.88% and 57.41% respective increases in reserves and member bank deposits came predominantly in the beginning of the decade. This is because from June 1921 to June 1925 reserves and deposits respectively increased 35.41% and 38.38%, but from June 1925 to June 1929 only 8.47% and 13.74%. The money multiplier increased more in the latter period. In the earlier half growth was accounted for predominantly by the increase in reserves at 92.11% compared to the 7.89% from the money multiplier. However, the latter half had more growth carried by the money multiplier, which accounted for 38.84% of the growth while the increase in bank reserves only 61.16%.

⁸⁷ They attribute the first ratio to an increase in the public's real income, the second ratio to a relative decrease in reserve requirements, and the increase in high-powered money primarily to an increase in the gold stock. While the second reason is correct, there are problems with the first and third. On the first, the fall in the currency to deposit ratio was due mainly to a rise in bank deposits and not a fall in currency. The underlying reason for the rise in deposits was not due to a fall in the currency to deposit ratio (which is attributed to an increase in the public's real income which caused them to hold relatively more deposits instead of currency), but rather the increase in reserves and the money multiplier, brought on by the Federal Reserve, which allowed the increased deposits to be made. On the third, the increase in member bank reserves (the important part of high-powered money) was due to an increase in the Fed's controlled factors of increase, and not gold, as explained below.

In short, the money growth at the beginning was primarily from the increase in total bank reserves. As the decade progressed, bank reserves stopped increasing as much and so did member bank deposits. However, due to the intricately pyramided structure of the banking system, the reserves worked with the increasing money multiplier (recall that the deposit to reserve ratio rose during this period) to still continue the expansion. It was the increase in member bank reserves that accounted for most of the growth of member bank deposits and ultimately the entire money supply.

Space can now be devoted to showing what drove the increase in the money multiplier and total bank reserves. These causes will shed additional light on the monetary figures presented above.

Section IV: The Factors behind the Expansion

The Increase in the Money Multiplier

The abnormal growth of time deposits relative to demand deposits was due to legislation that cut the reserve requirements on time deposits relative to demand deposits and allowing member banks to pay interest on time deposits. This lowered the average reserve requirement on deposits and consequently increased the multiplier. Previously, under the National Banking System the average reserve requirement on both demand and time deposits was 21.09%. In 1913 with the advent of the Federal Reserve System this was cut to 11.61%, and then in 1917 to 9.76% (PMN 1937, 23). However, time deposits had an even lower requirement. In the old system there were equal reserve requirements on both demand and time deposits. Now, under the Federal Reserve there were lower requirements for time deposits relative to demand. In 1913 the requirement on time deposits was cut to

5%, and in 1917 it was cut to 3%. Compare this to the 7-13% reserve requirement on demand deposits for member banks during this time.⁸⁸ In addition, the 1913 Federal Reserve Act allowed member banks to pay interest on time deposits, making them more competitive relative to nonmember banks and savings banks, which had been allowed to pay interest in the National Banking era (PMN 1937, 29, 96).

Both of these institutional changes greatly incentivized commercial banks to switch their customers' deposits from demand to time in the 1920s. The customers, particularly businessmen and corporations, benefited by having their "idle" balances accrue higher interest in time deposits, while the banks benefited by freeing up reserves which allowed them to make more loans (PMN 1937, 99-100). The growth in time deposits was much larger in member banks compared to nonmember banks, and in more metropolitan areas, as Central Reserve City banks saw their time deposits increase at the enormous rate of 450% (Rothbard 1963, 100-01). Not coincidentally, these were also the areas where the Federal Reserve conducted its open market operations (Rothbard 1983, 240), and during the years where it engaged in the most expansionary operations (1922, 1924, and 1927), the growth in time deposits in commercial banks was the greatest (PMN 1937, 99).⁸⁹

The Federal Reserve System was well aware that its unequal reserve requirement policy was contributing to the abnormal growth in time deposits. Friedman & Schwartz note that the Federal Reserve discussed the matter at various points throughout the decade, i.e., in March 1924, May and June 1927, and May 1928 (Friedman & Schwartz 1963, 276-

⁸⁸ Member bank reserve requirements on demand deposits were 13% for Central Reserve City Banks, 10% at Reserve City Banks, and 7% for Country banks (Rothbard 1963, 97).

⁸⁹ For more on the 1922, 1924, and 1927 expansions, see below.

77). PMN show that the issue was discussed in the Fed's Annual Reports in 1926 and 1927 (PMN 1937, 100-01). Meltzer also records it being discussed in November 1925 (Meltzer 2003, 211-12). The fact that the Federal Reserve caused the relative discrepancy between deposits, was fully cognizant of the development, and unable to make up its mind on the dwindling reserve position of its member banks proves that the Fed was culpable. When Rothbard wrote that the original 1913 and 1917 acts were "surely an open invitation to the banks to do their best to shift deposits from the demand to time category", this expansionist policy can be extended into the 1920s as evidenced by the Fed's acquiescence in its later development (Rothbard 1963, 100).

Meltzer's rationale for using M1 to judge Federal Reserve policy and not include time deposits is that he interprets the shift in deposits as the commercial banks' response to the Fed's contractionary policy in the 1920s (Meltzer 2003, 257-58). This is incorrect because as noted above, the growth rates of time deposits were the highest when the Fed was most expansionary, while the overall growth rate was related to the initial expansionary legislation in 1913 and 1917. The growth in time deposits and in the money multiplier was due to expansionary Fed policy.⁹⁰

The Increase in Total Bank Reserves

Total banking reserves for member banks in this period consisted of member bank reserves. Member bank reserves were demand deposits at the Federal Reserve that banks could exchange for Federal Reserve Notes. The Federal Reserve was the banker's bank,

⁹⁰ For more on the growth on time deposits during the 1920s, see Anderson (1949, 139-42), Friedman & Schwartz (1963, 276-78), PMN (1937, 95-101), Rothbard (1963, 98-101) and Rothbard (1983, 235-41).

and its expansion of member bank reserves accounted for most of the expansion in the 1920s. As explained earlier, it is this figure that should be concentrated on and not the high-powered money figure.

Member bank reserves are one of the main liabilities of the Fed, the other being Federal Reserve Notes. Its main assets were its monetary gold stock and Federal Reserve Credit, which consisted of its total purchases and loans (Wheelock 1992, 18). Movements in member bank reserves and high-powered money during the 1920s have been described as being largely influenced by the Federal Reserve's contractionary "gold sterilization" policy. The process can be described as follows: when there is a gold inflow (outflow) which would cause expansionary (contractionary) pressure on the money supply, the Fed can offset it by decreasing (increasing) Federal Reserve Credit in order to neutralize its effects. Figure 8 illustrates this process. At the beginning of the decade, the Fed "allowed" gold to enlarge the stock of high-powered money by not reigning in Reserve Credit enough. However, after a couple of years "gold movements were largely offset by movements in Federal Reserve credit so that there was essentially no relation between the movements in gold and in the total of high-powered money; the fairly irregular dips and rises in the gold stock were transformed into a horizontal movement in total high-powered money" (Friedman & Schwartz 1963, 279-82).⁹¹ Overall then, since gold increased and Federal Reserve Credit did not decrease enough, gold was partially able to affect the monetary base and member bank reserves and hence the money supply. The gold inflow is what caused

⁹¹ Figure 2 shows member bank reserves instead of high-powered money because that is what is more important. However, the analysis does not change, see Wheelock (1992, 16) who also only graphs member bank reserves.

the increase in member bank reserves. The gold inflow was the expansionary factor and Federal Reserve Credit was the (less powerful) contractionary factor (Friedman & Schwartz 1963, 298). Meltzer puts the matter succinctly when he writes that “The Federal Reserve was responsible for sterilizing gold inflows and for the deflationary policy in the United States” (Meltzer 2003, 258).

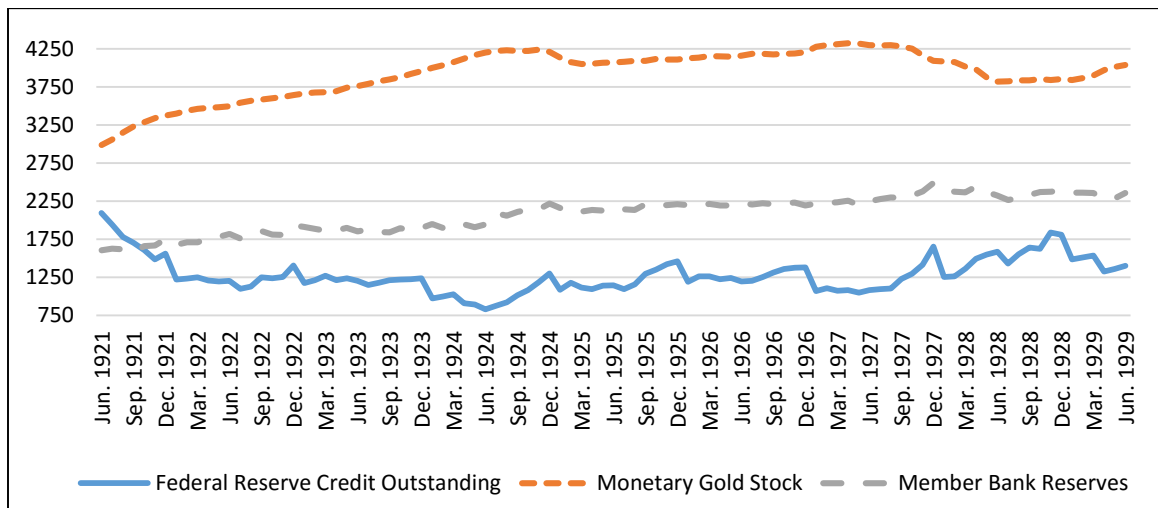


Figure 8: Gold Sterilization, 6/21 to 6/29 (in millions of dollars)

Data from Board of Governors (1943, 374-75).

This analysis of gold and Federal Reserve Credit movements heavily influenced future monetary historians and is the dominant interpretation of the era (Meltzer 2003, 257; Timberlake 1993, 262; Wheelock 1992, 14). However, closer scrutiny reveals that it is not an accurate interpretation. In order to fully show what drove the growth in member bank

reserves, one must not only consider the important factors of increase and decrease, but also distinguish between the controlled and uncontrolled reasons (Rothbard 1963, 103; Salerno 1999, 429).

In total, there are ten factors of increase and decrease that affect member bank reserves. Growth in a factor of increase expands member bank reserves, while growth in a factor of decrease contracts them.⁹² Only the main factors of increase and decrease, with attention to whether or not they are controlled, are discussed here. They are currency in circulation, the monetary gold stock, Federal Reserve assets purchased, and bills discounted.

Currency in circulation is a factor of decrease, while the monetary gold stock is a factor of increase. Both are uncontrolled and decided by the public. These factors influence member bank reserves because banks deposit unwanted, or withdraw needed, cash and gold at the Fed.

Federal Reserve assets purchased and bills discounted are the primary components of Federal Reserve Credit. These factors directly impinge on member bank reserves. Federal Reserve assets purchased consisted of government securities and acceptances. It bought and sold government securities at its discretion, with the former action being a factor of increase while the latter being a factor of decrease. Acceptances, confusingly labeled as “Bills Bought”, were an IOU financial instrument for which the Federal Reserve announced a rate at which it would buy and then purchased all that were presented to it.

⁹² A complete description of these factors can be found in Rothbard (1963, 103-07) and Board of Governors (1943, 262-65). See also Table 11 which lists all of the factors.

The Fed only passively bought them as a factor of increase. It rarely sold them but instead allowed them to mature which had the effect of a factor of decrease (Wheelock 1992, 34). Changes in these assets were entirely under control of the Federal Reserve. Bills discounted represented short term loans to banks and were made up of either discounts or advances. Discounts were temporary repurchases (rediscounts) of a bank's IOUs and were in essence loans. Advances were outright loans to a bank with government securities as collateral. Like Federal Reserve assets purchased, an increase in bills discounted was a factor of increase while a decrease (bills repaid) was a factor of decrease.

One might think that movements in bills discounted was also entirely under the control of the Federal Reserve. However, this neglects the contemporary policy at the discount window, which was inherently expansionary. This was due to two reasons. The first was that the discount rates at the reserve banks were non-penalty (which meant it was profitable for a bank to borrow from the Fed), while the second was the implicit allowance of continuous borrowing, which meant that a bank could theoretically remain indebted to the Fed for significant periods of time (Rothbard 1984, 125). In other words, it was entirely at the discretion of the indebted bank whether to continue borrowing or repay its indebtedness. Thus, while an increase in bills discounted was a controlled factor of increase since the Fed consciously decided to discount bills presented to it, an increase in bills repaid (or a net reduction in bills discounted) was an *uncontrolled* factor of decrease because the "banks were deliberately and autonomously diminishing their level of indebtedness to the Fed" (Salerno 1999, 431).

This position, which is best defended by Rothbard (1963, 105), has momentous implications for understanding the Federal Reserve's actions in this period. In particular, it means that Federal Reserve Credit is not completely under the control of the authorities and thus should be not used as a guide for Fed policy actions. Before analyzing what this implies for the growth of member bank reserves, space is briefly provided to defend the propositions that the Fed discount window was non-penalty and continuous, and also to analyze the contemporary policy, known as the "Riefler-Burgess" doctrine, that purportedly allowed the Fed to still control member bank indebtedness through other means.

For the purposes of this chapter, a penalty rate can be defined as a rate the Fed charges such that it is not profitable for banks to borrow from it.⁹³ At a penalty rate, the bank would only borrow when it is in dire need. The Federal Reserve was initially set up in 1913 to administer such rates. However, the immediate 1914-15 recession and a desire to boost bank earnings caused doubts about the measure, and the advent of WW1 brushed aside any question of penalty rates as the Fed was completely subservient to financing needs of the Treasury. After the war, several Board members and Governors wanted to administer them, but Treasury exhortations prevented their initiation. The sharp recession of 1920-21 ended any talk of penalty rates, including from its once adamant supporter New York Fed Governor Benjamin Strong. This was mostly due to political pressure. President Warren G. Harding and Secretary of the Treasury Andrew P. Mellon urged rates to be

⁹³ For example, if the discount rate is 4% and a relatively riskless market rate is 5%, then a bank can profit by borrowing through the arbitrage differential. The bank could also profit by discounting paper at 5%, and then rediscounting it at a reserve bank at 4%.

reduced to improve business conditions, particularly in agriculture, before the 1922 Congressional elections. Congress even threatened legislation to limit the Fed's ability to raise discount rates. Politics, combined with theoretical debate over what exactly constituted a penalty rate, forced the Fed to abandon the policy (Anderson 1949, 71-73, 153-54; Friedman & Schwartz 1963, 234-35; Harris 1933, 36-48; Meltzer 2003, 73-117, 119-35).

Figure 9 shows the Federal Reserve Bank of New York's discount rate in relation to the prime commercial paper rate and its average customer loan rate.⁹⁴ Throughout the 1920s it was clearly a non-penalty rate. It kept the rate too low, and moreover, when it wanted to raise the rate it did so too meekly and supinely to restrict credit, particularly in 1923, 1925, 1928, and 1929 (PMN 1937, 93-95).

⁹⁴ The discount rate at other reserve banks was usually higher, however, so too were loans they charged to customers (Harris 1933, 4; Board of Governors 1943, 440, 463).

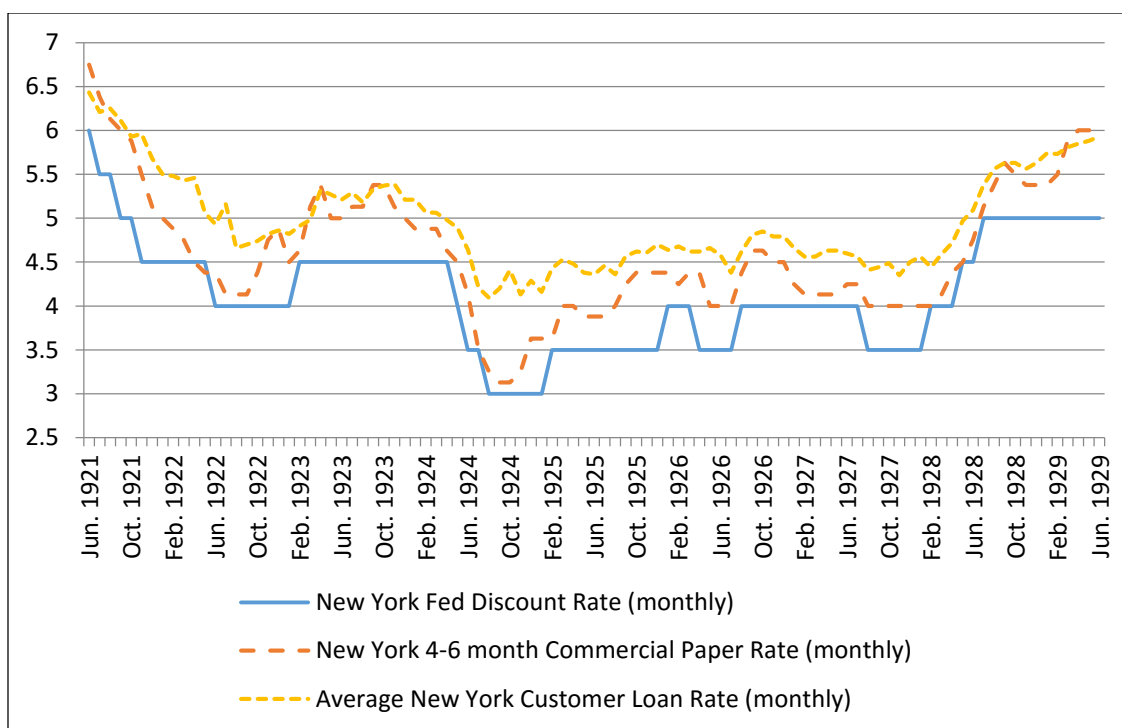


Figure 9: New York Discount and Market Rates, June 1921 to June 1929

Data from Board of Governors (1943, 440-41, 450, 463).

The Federal Reserve tried to get around vigorously changing its rates by instead relying on “direct pressure”, or “moral suasion”, to prevent banks from continuously borrowing. They maintained that banks were reluctant to borrow and that recurring indebtedness was not allowed (Bordo & Wheelock 2013, 14). The Annual Reports in the 1920s affirmed this policy, and Friedman & Schwartz say that it was apparently effective in limiting discounts, and Timberlake has also said lending during this period was tight (Friedman & Schwartz 1963, 268-69; Timberlake 2000a). This however, was a myth. In the first place, when “moral suasion” was purportedly tried instead of rate increases in 1928

and 1929 to curb stock market loans, the policy was not very effective (Friedman & Schwartz 1963, 265-66). Furthermore, in 1925 the Federal Reserve Board organized data on bank borrowing from the Fed for at least a year and calculated that by August 1925, 593 member banks had been borrowing for a year or more, with 239 borrowing since 1920 and 122 borrowing since before then.⁹⁵ Schwartz seemed to even repudiate her earlier view when she concluded after looking at the data that “continuous borrowing year in and year out in the 1920s was not uncommon” (Schwartz 1992, 58, 60). In 1926 Governor Strong, who was publicly in favor of the reluctant borrower view, admitted that 900 banks had been borrowing continuously for at least one year (Meltzer 2003, 213). The bottom line was that whether or not the Fed actually admitted it, continuous borrowing was allowed.⁹⁶

Closely intertwined with continuous borrowing and bank indebtedness was the “Riefler-Burgess” doctrine, a theory held by many officials which they believed allowed them to still control bank borrowing in light of the ineffectiveness of changing rates. The doctrine, first described by Burgess (1927) and Riefler (1930), was that the Federal Reserve could control the volume of member bank borrowing through open market operations (buying and selling government securities). When the Fed bought government securities, the banks would use this money to pay off their debts and maintain the same level of credit. When the Fed sold government securities, banks would borrow more money in order to

⁹⁵ White notes that on June 30, 1925 there were 9,538 member banks, and so this “small, but significant minority” of indebted member banks in 1925 represented 6.2% of the total member banks (White 2013, 43, 44, 53).

⁹⁶ See also Tallman (2013, 104-05), who challenges Bordo & Wheelock on their interpretation of the discount window and says that member banks were able to effectively borrow from it.

maintain the same level of credit. So an increase in government purchases and a decrease in the discount rate could lead to a decrease in bills discounted, and vice versa (Meltzer 2003, 161-63; Wheelock 1992, 20-22). This was closely related to the “scissors effect” described by Friedman & Schwartz (1963, 296). This theory was held among officials at the central bank to interpret whether or not the market was “easy” or “tight”. Strong agreed with the theory and wrote the introduction to Burgess (1927), and tried to apply it throughout the 1920s. His application of it sometimes made it be called the “Strong-Riefler-Burgess” doctrine (Wheelock 1992, 21-23).⁹⁷

The weak link in this theory was that it said member banks were reluctant to borrow and there was a tradition against borrowing for profit (Meltzer 2003, 163). Despite all the pronouncements and assertions to the contrary from the Federal Reserve, banks did often borrow to try and make a profit.⁹⁸

Regardless of its flaws, the use of the doctrine by officials raises the important question of whether or not the Fed actually did control bills repaid. Meltzer argues in the affirmative as he writes that “the new approach used open market operations to *force* banks to borrow *or repay*” (Meltzer 2003, 16, my emphasis). Figure 10 presents total bills discounted alongside government securities and monetary gold and currency in circulation. As shown, there were three major periods of increases in government securities, October

⁹⁷ Also see Rothbard (1984, 121) who provides a quote from Strong that states a goal of his purchases was to reduce bank borrowing.

⁹⁸ To be fair, Anderson also held that the non-penalty rate policy was not so much of a problem because bankers were reluctant to borrow and remain in debt (Anderson 1949, 153-54). This definitely seems related to his praise for Burgess (1927), which he called “[an] excellent book” (Anderson 1949, 146).

1921 to May 1922, October 1923 to November 1924, and March 1927 to December 1927. The last period coincided with no change in bills discounted, thus showing that banks were in control of when to diminish their net indebtedness and were not reluctant to borrow (Meltzer 2003, 227). And while the other two periods occurred with increases in bills repaid, these trends started much earlier than the increase in government securities. They were instead inaugurated by an increase in the monetary gold stock and a decrease of currency in circulation, both uncontrolled factors determined by the public. What reduction in bank indebtedness that occurred alongside the securities purchases was at the total discretion of the banks and not the Fed, which they could have chosen not to do, as the analysis of 1927 shows. The idea that the Fed could control member bank borrowing given its loose discount rate policy is shown to be untrue as the banks always had full discretion about when to repay.

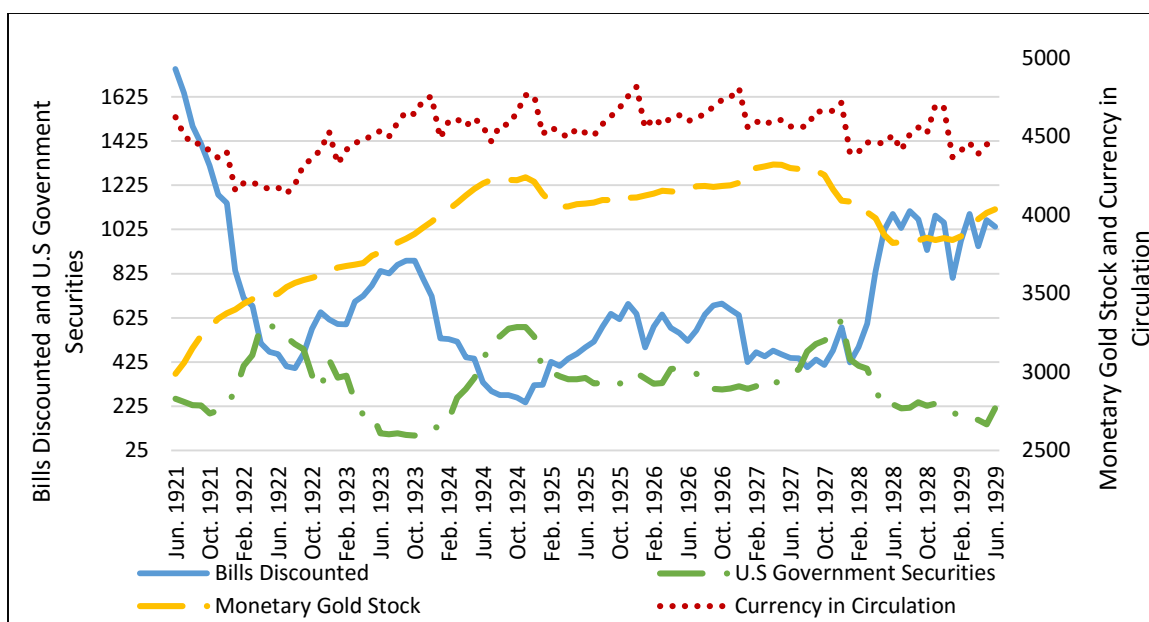


Figure 10: Movements in select Factors, June 1921 to June 1929 (in millions of dollars)

Data from Board of Governors (1943, 374-75).

This has important implications for the gold sterilization thesis. The increase in bills repaid is what “sterilized” most of the gold inflow during this period, more so than the Fed selling government securities. Wheelock agrees with this but writes that although “much of the sterilization of gold...was at the initiative of member banks...it was definitely the Fed’s intent that sterilization occur” (Wheelock 1992, 18). Using this as an interpretation of policy is misleading, because what matters is what the Fed could *actually* control. The offsetting of gold inflows during this period can only be properly understood in light of separating controlled and uncontrolled factors and not simply Federal Reserve Credit.

With this in mind, a complete analysis of what drove the increase in member bank reserves is now possible. Table 11 shows all the components of the changes in member

bank reserves from June 1921 to June 1929. All of the factors of increase and decrease, controlled and uncontrolled, are presented here. However, the major factors that matter are the ones discussed earlier. In addition, the signs on the factors of decrease have been rearranged to more clearly show their effect on member bank reserves.⁹⁹ The chosen periods were decided by Rothbard (1963, 111). The table shows that controlled factors are what drove the expansion as uncontrolled reserves declined by 1.040 billion, while controlled reserves increased by 1.794 billion (Rothbard 1963, 108). Controlled Federal Reserve Credit accounted for 86.84% of the 1.794 billion increase.¹⁰⁰ This sheds more light on the expansion in member bank reserves than simply looking at changes in the two main monetary assets (monetary gold stock and Federal Reserve Credit) because it takes into account controlled and uncontrolled factors. The fact that Federal Reserve Credit declined throughout this period is immaterial, since part of it was uncontrolled by the Fed.¹⁰¹ This point was not only made by Rothbard but also PMN (1937, 91-92).

Table 11: Changes in Reserves and Causal Factors, Over Twelve Periods, June 1921 to June 1929 (in millions of dollars)

⁹⁹ For example, the 487 million decrease of currency in circulation in Period 1 increased member bank reserves, so this is listed as a positive 487.

¹⁰⁰ Controlled Federal Reserve Credit is the sum of Net Bills Discounted, Bills Bought, U.S Government Securities, and Other Credit.

¹⁰¹ Toma misunderstands this point when criticizing Rothbard's monetary analysis because he wrongly concludes that Rothbard said Federal Reserve Credit was under the control of the authorities (Toma 2013, 109-110).

Factors	<u>I</u>	<u>II</u>	<i>III</i>	<u>IV</u>	<u>V</u>	<i>VI</i>	VII	VIII	<u>IX</u>	<i>X</i>	XI	XII
	<u>June</u> <u>1921-</u> <u>July</u> <u>1922</u>	<u>July</u> <u>1922-</u> <u>Dec.</u> <u>1922</u>	<i>Dec.</i> <i>1922-</i> <i>Oct.</i> <i>1923</i>	<u>Oct.</u> <u>1923-</u> <u>June</u> <u>1924</u>	<u>June</u> <u>1924-</u> <u>Nov.</u> <u>1924</u>	<i>Nov.</i> <i>1924-</i> <i>Nov.</i> <i>1925</i>	Nov. 1925-	Nov. 1926-	Oct. 1926-	<u>July</u> <u>1927-</u> <u>Dec.</u> <u>1927</u>	<i>Dec.</i> <i>1927-</i> <i>July</i> <i>1928</i>	July 1928-
Federal Reserve Credit	-996	305	-186	-388	355	235	-60	-268	562	-222	376	-409
-Net Bills Discounted		212	266			446	2		140	449	25	
-Bills Bought	100	132	-67	-168	277	45	-36	-151	220	-230	327	-407
-U.S Gov't Securities	278	-101	-344	339	153	-242	-41	91	225	-402	13	-12
-Other Credit	-28	62	-40	-9	17	-14	14	39	-22	-39	10	30
Cont. -Treasury Currency	115	93	47	14	5	-43	9	13	3	-2	8	7
-Treasury Cash	-43	16	2	4	0	5	-2	13	-4	7	-1	-2
-Treasury Deposits	-16	48	-29	-3	6	-2	0	14	7	-6	1	-13
-Unexp Capital Funds	56	6	-6	21	3	-15	-20	-3	-5	-28	-19	-26
-Net Bills Repaid	-1345			-550	-92			-248				-19
-Monetary Gold	554	100	238	321	39	-130	76	107	-201	-266	28	183
Uncont. -Money in Circulation	487	-393	-112	80	-203	8	23	175	-157	302	-272	227
-Other Deposits	1	-2	6	0	-6	-4	1	4	2	-3	2	-1
Controlled Reserves	462	468	-171	198	461	180	-74	16	564	-251	364	-423
Uncontrolled Reserves	-303	-295	132	-149	-262	-126	100	38	-356	33	-242	390
Member Bank Reserves (1604)	159	173	-39	49	199	54	26	54	208	-218	122	-33 (2356)
Monthly Percentage Change	.73%	1.88%	-.2%	.3%	1.96%	.2%	.1%	.2%	1.76%	-1.30%	1.05%	-.2%

Table 11 and Figure 11 Key

Bold– surges in member bank reserves (driven by increases in controlled reserves)Underline- increase in Federal Reserve assets Purchased*Italics* -decrease in Federal Reserve assets Purchased, increase in Bills Discounted

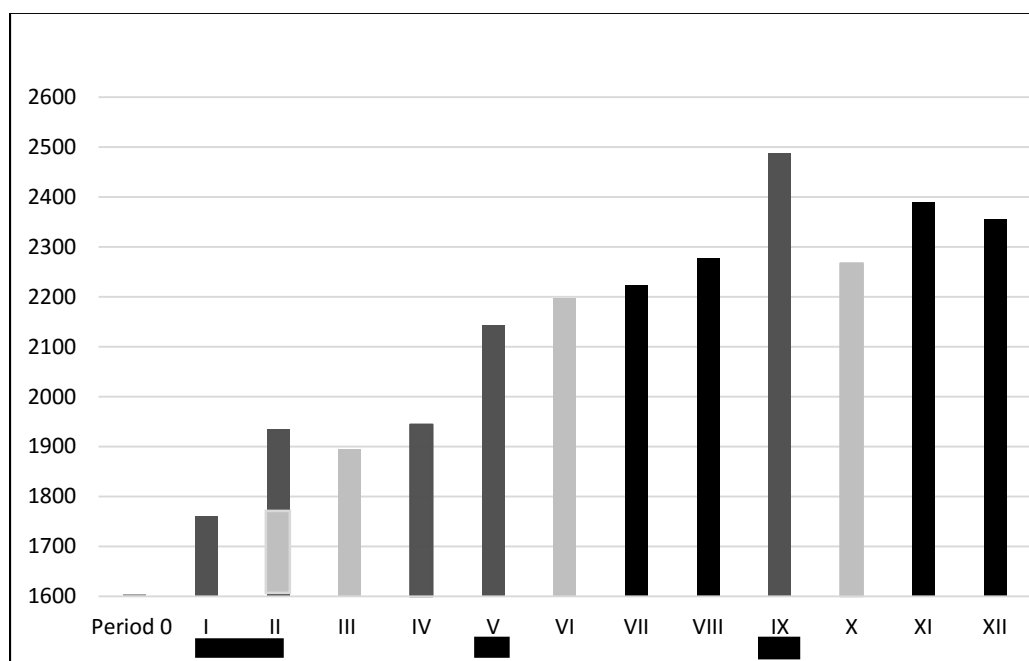


Figure 11: Member Bank Reserves, June 1921 to June 1929 (in millions of dollars)

Note: Due to rounding in the original source some of the tabulations do not completely add up. In particular, some summations of Federal Reserve Credit in certain years and the total change in Member Bank Reserves listed do not completely add up. The total change in member bank reserves by adding controlled and uncontrolled reserves each year sums up to 2358, although the true total is 2356. Any differences are so small they make no change in the economic analysis. Adapted from Rothbard (1963, 109). Data from Board of Governors (1943, 374-75).

Of the 46.88% increase in member bank reserves in this period, virtually all of it came in Periods I, II, V, and IX and was due to controlled reserves. These periods are June 1921 to December 1922, June 1924 to November 1924, and July 1927 to December 1927. They can be approximately described as 1922, 1924, and 1927. As explained earlier, it was during and slightly after these periods when the growth in the money supply, especially commercial bank time deposits, was the greatest (June 1922 to June 1923, June 1924 to June 1925, and June 1927 to June 1928). Figure 11 graphically represents this growth in member bank reserves. It shows that the growth that was accomplished in 1922, 1924 and

1927 was then roughly followed by a plateau of growth. There was an initial surge of member bank reserves, which remained relatively constant until the next great surge, and then the process was repeated until the end of the decade.

The increase in controlled reserves, which were responsible for the surges, was inaugurated by an increase in Federal Reserve assets purchased (Periods I, IV, V, and IX). In the periods after this when these purchases were contracted, member banks instead borrowed from the easy discount window in order to roughly maintain the same level of reserves (Periods III, VI, and X).¹⁰² The process was repeated again with a new initiation of Federal Reserve assets purchased (Rothbard 1963, 111-17, 126, 133). This analysis of jagged controlled member bank surges described by Rothbard was also lucidly explicated by Anderson (1949, 156) and PMN (1937, 88-95),¹⁰³ with the exception that Rothbard also emphasized the Federal Reserve's purchases of acceptances.¹⁰⁴

The increase in member bank reserves, far from being due to the Fed not fully sterilizing gold inflows, was in fact due to the Fed increasing its controlled reserves in three sharp bursts. These sharp jerks led to higher growth rates in the money supply, particularly

¹⁰² Recall that the increased borrowing from the discount window was related to the Fed's delayed and weak raises in the rate described earlier. Period II is a hybrid of both factors, as while government securities were sold, acceptances increased enough to increase total purchases. In Period III the sale of government securities was much more vigorous.

¹⁰³ When analyzing the monetary growth in the 1920s Robbins and Hayek tended to concentrate on the 1927 member bank surge, which Hayek called an "experiment" (Robbins 1934, 24-25; Hayek 1933, 7). PMN explicitly went beyond Hayek and also considered 1922 and 1924 as "experiments" (PMN 1937, 183-84).

¹⁰⁴ Acceptances were also the main factor in the increase and decrease in controlled reserves from late 1928 to 1929 (Periods XI and XII). For an analysis of the final months leading up to the stock market crash, which were also dominated by acceptances, see Rothbard (1963, 166).

in time deposits as discussed earlier, which increased the money multiplier and allowed for a further expansion of credit, especially in the latter half of the decade. PMN describe the entire process:

Chronologically and causally, the order of developments was as follows: Federal Reserve open-market purchases resulted in expansion of member bank reserve balances; this served to instigate increased purchases of investments by the member banks; and the credit generated thereby took the form largely of time deposits. The Reserve Banks pumped credit into the money market, inducing increased reserves in the banking system; the banks used the new reserves to purchase investments...which created more deposits in the banking system, and the increased deposits...were shifted to time deposits which would draw interest. This greater relative growth of time deposits operated to reduce the average reserve-deposit ratio, hence freeing reserves which in turn could be used by the banks further to increase their [deposits]...without any increase in reserves (PMN 1937, 99-100).

Thus the Federal Reserve was culpable for the augmentation in the money supply; instead of being too stringent its actions in fact generated an enormous expansion.

Section V: Conclusion

There are two major groups that have analyzed the monetary policy of the Federal Reserve in the 1920s. The first group argued that the Fed engaged in expansionary monetary policy and was largely responsible for the growth of the money supply in the 1920s. This position is best defended by Rothbard (1963) and was also held by older writers such as Anderson (1949), PMN (1937) and Robbins (1934). On the other hand, the second group described the Fed's actions as contractionary, since they argued that they sterilized, or offset, most (but not all) of the gold inflow. Friedman & Schwartz (1963) are the main proponents of this view, and modern monetary historians such as Meltzer (2003), Timberlake (1993), and Wheelock (1992) have largely agreed with them on this issue.

This chapter argued that the Expansionist group provided the best interpretation of monetary policy. It showed that the monetary expansion was driven by an increase in the money multiplier and total bank reserves, with the latter's augmentation the primary impetus. The increase in the money multiplier was primarily due to Fed legislation that lowered the relative reserve requirements on time deposits as opposed to demand deposits.

The increase in member bank reserves was shown to have been best understood by not looking simply at the increase in the monetary gold stock and the decrease in Federal Reserve Credit, but rather looking at changes in the controlled and uncontrolled factors of increase. I showed that Federal Reserve Credit was not an appropriate figure to understand the Fed's actions because bills repaid were an uncontrolled influence on member bank reserves. This was due to the expansionary discount window from the non-penalty rate and allowance of continuous borrowing, which meant that the banks were in

ultimate control of when to reduce their net indebtedness. The increase in the Federal Reserve's controlled factors jolted upwards in the three sharp bursts of 1922, 1924, and 1927 from heavy purchases of government securities and acceptances. In the interim between these jerks, member bank reserves were able to remain relatively stable due to the increased borrowing at the discount window. The spurts in the member bank reserves lead to the primarily to the creation of time deposits by the banking system, which increased the money multiplier and allowed for a further expansion of credit. Far from pursuing too stringent of a policy, the Federal Reserve was in fact culpable in generating an enormous expansion of the money supply.

The above research should be viewed as a complement and a reinforcement to those who argue for an ABCT interpretation of the 1920s by showing that the Fed produced a significant amount of credit expansion. Of course, the actual illustration of ABCT (the relative distortions in the production structure from the expansion in credit) are not shown, which is a task left to other studies.

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BIOGRAPHY

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