

THE DEPRESSION OF 1873–1879: AN AUSTRIAN PERSPECTIVE

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ABSTRACT: This paper analyzes the period 1867–1879 in American economic history from an “Austrian” perspective. The post-Civil War boom, the Panic of 1873, and the subsequent downturn are investigated in light of Austrian Business Cycle Theory (ABCT) and its structure of production framework. This paper shows how recent legislation allowed for monetary inflation and a boom to develop 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.

KEYWORDS: Panic of 1873, Austrian Business Cycle Theory, Depression of 1873–1879, national banking system

JEL CLASSIFICATION: E2, E3, E4, N1, N2

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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 and 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 paper 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 (1870–1873) and bust (1873–1879), 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 and Garrison, 2003; Hughes, 1997; Powell, 2002; Rothbard [1963] 2008; Salerno [1988] 2010, 2012) instead of an econometric study (e.g. Bismans and Mougeot, 2009; Fisher, 2013; Keeler, 2001; Lester and Wolff, 2013; Luther and Cohen, 2014; Mulligan, 2006; Wainhouse, 1984; Young, 2012). The existence of an ABC in the 1870s is 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 paper shows how political

¹ Space constraints preclude a more thorough study that distinguishes among other rival business cycle theories.

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 (1873–1879) is grossly exaggerated.

The paper 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 paper. Section IV provides the necessary historical analysis of monetary institutions and the economic narrative for the three time periods of study: 1867–1873, 1873–1875, and 1875–1879. Section V concludes the paper and Section VI is the Appendix, where the referenced tables and figures can be found.

SECTION II: THEORY

The following section provides a brief summary of what can be called “capital based macroeconomics” (Garrison, 2001, pp. 7–8). This review is essential as capital based macroeconomics is extensively used to interpret the economic landscape from 1867–1879, 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.

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 its constant money income at their lower time preferences. The opposite occurs with an increase in time preferences. The process is depicted in Figure 2.²

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.³ 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 because of the increase in spending, aggregate money incomes also increase. A boom begins.

Since time preferences have not changed, the public spends its enlarged income at its old time preference spending patterns, which pushes prices up in the lower orders.⁴ 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

² For a more in depth overview of Austrian structure of production theory and this basic growth scenario, see Garrison (2001, pp. 33–67), Hayek ([1931] 2008a, pp. 223–240), Huerta de Soto (2006, pp. 266–346), Rothbard ([1962] 2009, pp. 319–555), and Skousen (2007, pp. 133–264).

³ More specifically, inflation occurs when the increase in the money supply is not offset by an increase in the demand for money (Mises, [1953] 2009, p. 240; 2004, pp. 44–45). This definition is different from the one proposed by Rothbard ([1962] 2009, p. 990; [1963] 2008, p. 12).

⁴ The inflation can actually cause capital consumption through an accounting illusion (Mises, [1949] 2008, pp. 549–550; Rothbard, [1962] 2009, pp. 993–994). When this occurs, time preferences increase.

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.⁵

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 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.

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.⁶ 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.⁷ Credit contraction also has

⁵ For a more in depth analysis of ABCT, see Garrison (2001, pp. 67–83), Hayek ([1931] 2008a, pp. 241–247), Huerta de Soto (2006, pp. 347–384), Mises ([1949] 2008, pp. 542–563), Rothbard ([1962] 2009, pp. 994–1004), and Skousen (2007, pp. 282–331).

⁶ More specifically, it is a decrease in the supply of money not offset by a decrease in the demand for money (Mises, [1953] 2009, p. 240).

⁷ The following arguments regarding a decline in nominal spending are different than those Austrians who adhere to Monetary Disequilibrium Theory. For supporters of

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, [1949] 2008, p. 547; Rothbard, [1962] 2009, p. 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 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, [1949] 2008, pp. 564–565; Rothbard, [1963] 2008, p. 18; Rothbard, [1962] 2009, pp. 1005–1006).

SECTION III: DATA

This section presents the rationale behind the particular data sources and series used. Much of this analysis may seem overly

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, pp. 221–243) and Horwitz (2000, pp. 141–175; 2006; 2014) for a more in depth explanation.

technical and out of place, but since this paper 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 they are less precise than modern figures as the underlying data were not collected for the purpose of making GNP estimates (Rhodes and Sutch, 2006, pp. 3–12).

The three GNP series used in the analysis are taken from Balke and Gordon (1989), Johnston and 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 and Williamson (2013) and Sutch (2006b, series Ca213 and Ca216).⁸

⁸ It should be noted that the Johnston and Williamson series incorporates the Davis industrial production index in its annual observations (Johnston and Williamson, 2008).

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 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. A 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 paper 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 Ea584–587). 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, [1949] 2008, pp. 549–550, 556; Rothbard [1963] 2008, p. 85). The interest rates are taken from James and 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 ([1978] 2011, pp. 736–739), 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 ([1949] 2008, pp. 429–431) 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.⁹

In order to accurately depict the effects of credit expansion on the structure of production one must concentrate solely on the

⁹ This particular definition of M_a , best defended in Rothbard ([1978] 2011, pp. 727–739) and Salerno ([1978] 2010, pp. 115–130), is different from other Austrian definitions such as Mises ([1949] 2008, pp. 429–431, 459–463) and White (1989, pp. 203–217) 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 and Schwartz (1970, pp. 79–81).

increases in M_a created through business loans and investments (M_b). 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, p. 42; Welfling, 1968, p. 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 and Schwartz ([1963] 1993, p. 704) as opposed to the figures used by Rothbard ([1983] 2005, pp. 153–154). Due to the imperfections of the statistical collection of the figures used by the latter, they are undoubtedly inferior to the Friedman and Schwartz estimates.¹⁰ Using those figures would significantly overstate 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 Cc114–121), 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 [1931] 2008b, p.444; Rothbard, [1962] 2009, p. 543). To reiterate, the “stages” or

¹⁰ 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 and Schwartz [1963] 1993, p. 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 figures may include mutual savings banks as well as loan and trust companies (Bodenhorn, 2006, pp. 3-634).

“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.

During the post-Civil war era there was a large expansion in the railroad and railroad related industries (Cain, 2006, series Df874; Fishlow, 2000, pp. 583–584). They were a major American industry and financially accounted for 15–20 percent of American capital investment (Moseley, 1997, p. 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, p. 16; Fishlow, 2000, p. 585).¹¹ 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 and Machinery figures, which contains locomotives as an included series.¹²

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 lower orders to

¹¹ 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, pp. 18, 22–23).

¹² 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.

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.¹³

SECTION IV: HISTORICAL AND ECONOMIC ANALYSIS, 1867–1879

The intervals were chosen to best capture the macroeconomic trends during each period. The first two periods, 1867–1870 and 1870–1873, were chosen to best distinguish changes in the economy during periods of credit expansion. The third period, 1873–1875, was chosen because it was the post-panic years listed by Wicker (2000, pp. 30–31) while the fourth period, 1875–1879, 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 and Schwartz ([1963] 1993, p. 704). It is noticeable in the output series that exceptionally strong growth occurred in 1879. Extending the growth analysis to 1875–1879 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.

¹³ 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, [1949] 2008, p. 558; Rothbard, [1963] 2008, pp. 169–170). 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.

Part 1: The Post-Civil War Boom, 1867–1873

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 and Schwartz [1963] 1993, p. 24). At the end of the war in 1865 the total supply of greenbacks stood at \$400 million (Timberlake, 1993, p. 133), and afterwards Congress contracted them to \$356 million by the end of 1867. From 1867–1870 the federal government retired most of the Treasury demand notes that were remnants of the wartime economy (Friedman and Schwartz [1963] 1993, pp. 24, 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, p. 34). National banks could only issue notes up to 90 percent of the value of federal government securities they deposited with the Treasury (Klein, 1970, p. 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 percent annual tax on all state bank note issues after July 1866 in order to force all state banks to become national banks (Friedman and Schwartz [1963] 1993, pp. 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, p. 144).¹⁴ Before, in the pre-Civil War era system, each bank held its own reserves in terms of its 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 led to greater credit creation.

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 percent, while country banks had 15 percent. While central reserve city banks had to keep 25 percent 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 percent lawful money and up to 50 percent in interest-paying deposits at central reserve city banks. Country banks had a minimum of only 40 percent lawful money reserves and could keep up to 60 percent in interest-paying deposits at either central reserve city or reserve city banks (Friedman and Schwartz [1963] 1993, pp. 56–57; Rothbard [1983] 2005, pp. 136–137). 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 and Schwartz [1963] 1993, p. 21; Rothbard, 2005, p. 144). Thus a multi-layered credit pyramid was formed with state banks pyramiding off any national bank, country banks off central reserve city and reserve city banks, and reserve city banks off central reserve city banks, where lawful money reserves were generally concentrated.

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.

¹⁴ 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 the same base reserves (in this period, lawful money).

Economic Analysis

The economic climate in this period can be broken up into two parts: from 1867–1870, when there was mild growth in M_a and M_b , and from 1870–1873, 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 1867–1870 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 1870–1873 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 and Schwartz [1963] 1993, pp. 56–57).

It is clear that during both periods there was strong growth. Comparisons of GNP between 1867–1870 and 1870–1873 can only be made with the Davis and the Johnston and Williamson figures as the Balke and Gordon and Romer series start later. One can observe the difference between the Davis and the Johnston and 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.¹⁵ 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 cases rose in even nominal amounts.¹⁶ 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 1867–1870 interest rates slightly fell.¹⁷ At the beginning of the significant credit expansion from 1870–1871 interest rates continued to fall. However from 1871–1873 interest rates began to rise.¹⁸ 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

¹⁵ In 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 1865–1870, 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.

¹⁶ Though they still rose relative to before, chemicals prices did continue to fall during this period, although they increased absolutely from 1871 onward.

¹⁷ 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, pp. 69–75).

¹⁸ Part of the rise in 1873 was due to the Panic of 1873, but what matters is that the trend had begun in 1872.

during this time are graphically shown by Figure 3, particularly Phases 1 and 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, 1873–1875

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 large amounts of cash from 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 and Krooss, 1952, p. 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 and Co. closed its doors on September 18th, full of worthless Northern Pacific railroad securities (Wicker, 2000, p. 20). Stocks plummeted and the New York Stock exchange responded by closing for 10 days on September 20th (Glasner, 1997, p. 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 equal-ization 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, p. 31). In addition, during the crisis there were a number of bank suspensions, which occur 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, which had a combined 59 bank suspensions (Wicker, 2000, p. 19).

By the end of October, cash redemption was resumed in most banks except a few in the South (Sprague, 1968, pp. 68–71).

Wicker (2000, p. 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 led 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 and Schwartz [1963] 1993, pp. 24, 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 1870–1873. 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 1867–1870. The increases in M_a predominantly and in M_b entirely came during 1874–1875. 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 and Schwartz [1963] 1993, p. 57; Rothbard [1983] 2005, p. 141). It would have been far better for the economy if the government had not intervened 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 businesses realized that many of their projects were unprofitable.

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, p. 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.¹⁹ As can be seen in 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.²⁰ It is clear that the sectors with the

¹⁹ Rockoff and Wicker also have somewhat similar views on the economic effects of the panic, with Rockoff (2000, p. 669) stating that “The crisis did not leave a strong impression on the aggregate economic statistics,” and Wicker (2000, p. 30) commenting that “Contemporary accounts describe the post-panic [1873–1875] 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.”

²⁰ The exception in this period being again Textiles.

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.

Part III: The Recovery and Resumption, 1875–1879

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 \$347 million (Friedman and Schwartz [1963] 1993, pp. 24, 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 1877–1879 refunded a large amount of debt to build up a redemption fund (Friedman and Schwartz [1963] 1993, pp. 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 1873–1875. 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 1873–1879 was mainly due to faulty economic statistics and reliance on nominal rather than real values.

Both M_a and M_b in this period declined at significant rates that were only very rarely seen in U.S economic history (Friedman and Schwartz [1963] 1993, pp. 31, 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; banks responded by building up their reserves (Friedman and Schwartz [1963] 1993, pp. 56–57, 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.

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 1875–1878 show a sharp rebound in growth as compared to 1873–1875. The only one that did not was the Balke and Gordon index, which one could reasonably argue understates growth in the mid to late 1870s because one of the main series they build on was the railroad output-dominated Frickey transportation and communications index (Balke and Gordon, 1989, p. 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, pp. 105–106). 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.²¹ Wages

²¹ Textiles again serving as an outlier.

were also flexible during this period and fell from 1873–1879. After rising 5.55 percent from 1870–1873, hourly nominal manufacturing wage rates fell 3.27 percent from 1873–1875, and from 1875–1879 fell 13.27 percent. In total, from 1873–1879 they fell 16.11 percent (Margo, 2006, series Ba4290).²² Similarly, interest rates throughout this period also fell. The growth for this period was healthy and 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 by the appearance 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. Wage earners did not realize that consumer prices also dropped, and their real income did not decline as much as they thought (Morris, 2006b, pp. 103–104).²³ A similar argument can be found in Davis (2006, p. 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' reasoning was similar: 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, "There was much apprehension to be added to reality" (Kleppner, 1979, pp. 124–125). Reznack (1950, p. 497), whose classic article famously gave a negative picture of the 1870s,

²² On the lack of downward nominal wage rigidity in the late 19th century in the 1860s and 1870s, see Hanes and James (2003).

²³ 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, p. 103).

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 regard to the depth of the depression, especially concerning unemployment.²⁴ Modern estimates of unemployment also tend to be inaccurate in light of more recent economic data. Lebergott (1971, p. 80) provides an estimate of over two million, which would roughly correspond to 13 percent in the depths of the depression. Vernon’s (1994, p. 710) annual unemployment series is more reasonable, but still shows unemployment rising until it peaks at 8.25 percent in 1878, which seems hard to believe given the GNP growth rates.²⁵

²⁴ For example, a New York relief agency estimated that during 1873 roughly 25 percent of the city’s working force was unemployed. They arrived at this estimate by counting all of the people whom 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, pp. 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, pp. 104–105).

²⁵ After selecting full employment benchmark years, he derives his estimates by regressing on the Balke and Gordon series and uses Okun’s law to get a figure of deviations from trend of output to produce annual unemployment rates (Vernon, 1994, pp. 702–707). 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 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 1873–1875, 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

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.

The length of the depression was perceived to be from 1873–1879 when in reality it was closer to 1873–1875 because contemporary accounts relied on nominal series and had poor access to aggregate economic information. And aside from some monetary interventions from 1873–1879, 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 ([1983] 2005, pp. 154–155) appropriately writes, “It should be clear, then, that the ‘great depression’ of the 1870s is merely a myth—a

percentage from the years 1900–1940, 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 and Gordon’s annual series, which one can reasonably expect to understate growth.

myth brought about by misinterpretation that prices in general fell sharply during the entire period.”

SECTION VI: APPENDIX

For more intricate structure of production diagrams, the following sources can be consulted: for Figure 1, see Hayek ([1931] 2008a, p. 233), Garrison (2001, p. 47), Huerta de Soto (2006, p. 293), Rothbard ([1962] 2009, p. 369) and Skousen (2007, p. 203); Figure 2, see Hayek ([1931] 2008a, p. 239), Garrison (2001, p. 62), Huerta de Soto (2006, p. 334), Rothbard ([1962] 2009, p. 521), and Skousen (2007, p. 235); Figure 3, see Hayek ([1931] 2008a, pp. 242, 244), Garrison (2001, p. 69), Huerta de Soto (2006, pp. 356, 383) and Skousen (2007, pp. 288, 296).

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

All growth rates are compounded annually. For the monetary periods 1873–1875 and 1875–1879, the intervals also include half years, and as such the growth rates are adjusted accordingly.

Figure 1. The Structure of Production

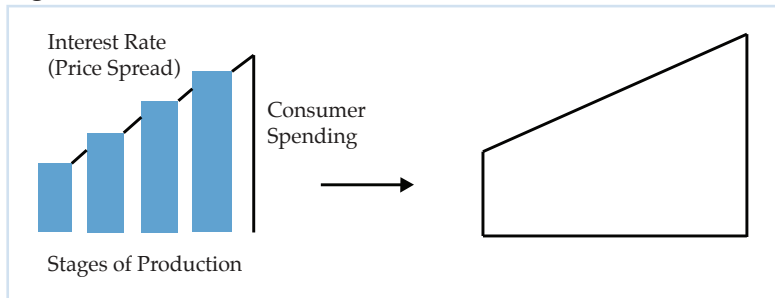


Figure 2. Time Preference Induced Growth

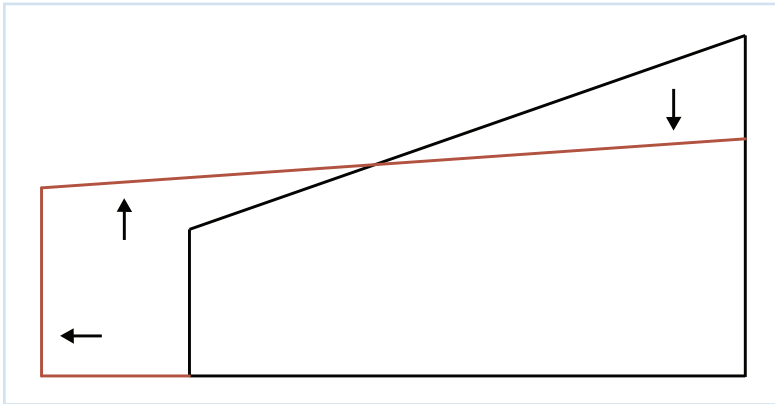


Figure 3. Credit Expansion Induced Growth

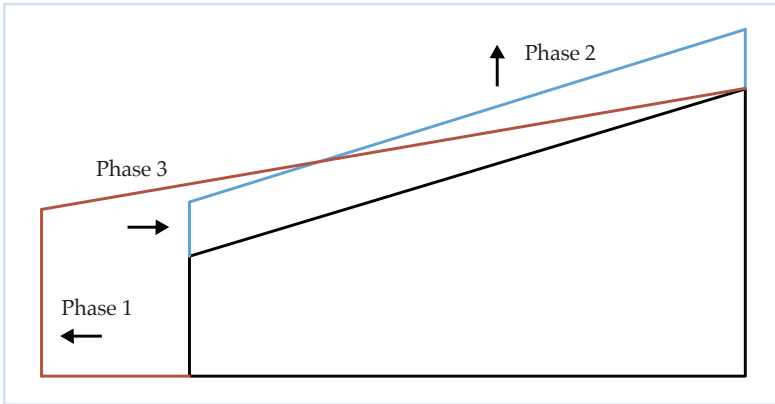


Table 1. Prices and Production Series

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

Table 2. U.S Economy, 1867–1873 (per annum growth rates and levels)

Interest Rates (level)					GNP (growth rates)		
1867	1870	1871	1872	1873		1867 - 1870	1870 - 1873
7.32%	7.23%	6.98%	8.63%	10.27%	Davis	4.97%	7.53%
Money (growth rates)					J and W	3.20%	7.20%
	1867 - 1870		1870 - 1873		B and G	---	4.57%
M _a	2.75%		10.15%		Romer	---	7.45%
M _b	2.23%		11.16%		Bounds	3.2 - 4.97%	4.57 - 7.53%
Production (growth rates)				Prices (growth rates)			
	Industry	1867 - 1870	1870 - 1873	Industry	1867 - 1870	1870 - 1873	
Lower Orders	Wood and 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 and Lighting	-2.37%	3.36%	

Table 3. U.S Economy, 1870–1875 (per annum growth rates and levels)

Interest Rates (level)					GNP (growth rates)		
1873	1874	1875	---	---		1870 - 1873	1873 - 1875
10.27%	5.98%	5.44%	---	---	Davis	7.53%	-3.02%
Money (growth rates)					J and W	7.20%	0.81%
	1870 - 1873		1873 - 1875		B and G	4.57%	2.25%
M _a	10.15%		3.81%		Romer	7.45%	1.47%
M _b	11.16%		4.16%		Bounds	4.57 - 7.53%	-3.01 - 2.25%
Production (growth rates)				Prices (growth rates)			
	Industry	1870 - 1873	1873 - 1875	Industry	1870 - 1873	1873 - 1875	
Lower Orders	Wood and 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 and Lighting	3.36%	-7.00%	

Table 4. U.S Economy, 1875–1879 (per annum growth rates and levels)

Interest Rates (level)					GNP (growth rates)		
1875	1877	1878	---	---		1873 - 1875	1875 - 1878
5.44%	5.01%	4.82%	---	---	Davis	-3.02%	3.37%
Money (growth rates)					J and W	0.81%	4.10%
	1873 - 1875	1875 - 1879			B and G	2.25%	2.86%
M _a	3.81%	-2.78%			Romer	1.47%	6.77%
M _b	4.16%	-4.11%			Bounds	-3.01 - 2.25%	2.86 - 6.77%
Production (growth rates)				Prices (growth rates)			
	Industry	1873 - 1875	1875 - 1878	Industry	1873 - 1875	1875 - 1878	
Lower Orders	Wood and 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 and Lighting	-7.00%	-10.10%	

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