GOLD BONDS AND SILVER AGITATION

CLIFFORD F. THIES

1.

During the late nineteenth century, silver agitation threatened the gold standard in the United States. During this period of monetary uncertainty, well-secured railroad bonds promising to pay principal and interest in gold sold at a premium relative to similar currency bonds. Through 1893, this premium behaved exactly as would be expected, growing during the early 1890s as the Treasury's gold reserve gradually shrank under pressure of its silver purchases, reaching a peak during 1893 amidst a panic, and then falling quickly to zero after President Cleveland obtained a repeal of the silver purchase legislation. Perhaps surprisingly, this premium remained essentially zero during 1894 and early 1895 in spite of renewed attacks on the dollar, and only rose modestly during the exciting 1896 campaign of populist-Democrat Bryan.

Two newly-constructed time series, one of the yields of gold bonds, and the other of the yields on currency bonds enable this fresh look at the course of monetary uncertainty through the time of silver agitation. They verify some views of this period of history, e.g., that the financial markets were very concerned about the commitment of the United States to maintain the gold standard during 1893; and, challenge some others, e.g., that the financial markets were similarly concerned during 1894 and 1895 when the Treasury was being forced by continuing runs to actively defend the dollar. Regarding Bryan's 1896 campaign for president, they indicate that the financial markets were only moderately concerned. The distinction between the findings of this paper and the received history may be that the financial markets reflect the informed opinion of the time, whereas popular opinion was more imaginative.

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As will be developed below, the gold clause was not completely successful in protecting creditors from monetary uncertainty. This could have been due to an inability on the part of investors to perfectly distinguish between gold and currency bonds and to overall tightness in the U.S. financial markets, as well as to political risk associated with the gold clause (i.e., concern for its Constitutional protection). Nevertheless, the performance of gold bonds indicates that private contracts may be able, at least partially, to resolve uncertainty in the monetary standard.

The remainder of the paper is organized as follows: The next section describes the breakdown of the former bimetallic standard and its replacement by the gold standard in the latter half of the nineteenth century. Section 3 is a discussion of the emergence of, and the initial success of silver agitation to restore silver to monetary status in this country. In Section 4, the paper then takes a step back, to detail the development of the gold clause starting during the greenback era, both with regard to law and market acceptance. Section 5 describes the construction of the new time series of gold and currency bond yields. Sections 6 and 7 then use these new time series to examine the course of monetary uncertainty first through President Cleveland's securing of the gold standard, and then through the presidential campaign of 1986. Section 8 summarizes the paper, and offers some concluding remarks on gold bonds.

2. Background

Through most of the nineteenth century, the world was effectively on a bimetallic standard, with some countries (most notably, Great Britain) on gold, some on silver, and others (most notably, France) on both gold and silver, with the ratio decreed by France fixing the exchange rate of silver for gold at 15½ to 1. For 75 years, the ratio decreed by France proved determinate because of that country's ability and willingness to monetize the world's excess of whichever metal was overvalued by that ratio. But, by the latter half of the century, the monetary reserves of France had shifted almost entirely to the white metal. It was then obvious that France would not be able to continue to freely-exchange one for the other metal at its decreed ratio, but would be forced by lack of gold to be effectively on a silver standard, and that the value of silver relative to gold would fall. France and the other bimetallic and silver standard countries of the world were faced with the choice of accepting devaluation of their currencies, or of shifting to a gold standard. As first one and then another such country shifted to gold, it became increasingly imperative for the remaining bimetallic and silver countries to likewise shift (Yeager 1976, pp. 295-99; see also Bordo 1987; Kindleberger 1985).

Yeager ref. is missing.

In the United States, the shift from a bimetallic standard to gold was to be accomplished in conjunction with the post-Civil War resumption of convertibility. In the Coinage Law of 1873—later referred to as "the Crime of 1873"—Congress removed the silver dollar from the list of coins enjoying

unlimited legal tender status and free coinage. Resumption, as provided by the Resumption Act of 1875, and which took place in 1879, put the United States onto a *de facto* monometallic gold standard.

With an increased demand for gold and a decreased demand for silver as a monetary reserve in the world, the market price of silver began to drop. Furthermore, in the United States, the long, gradual deflation that enabled resumption to take place at the pre-Civil War parity burdened farmers and other debtors. A politically-powerful coalition emerged to restore silver to full monetary status, consisting of farmers and other debtors, which eventually came to be lead by Bryan, and senators from the western states where silver mining was a major industry (Unger 1974).

Unger is 1964 in ref.

3. Silver Agitation

The first success of the prosilver coalition was the Bland-Allison Act of 1878. This act directed the secretary of the Treasury to coin not less than $2 million and not more than $4 million worth of silver every month. Although these coins did not enjoy full legal tender status, they were acceptable in payment of customs, taxes, and other government dues. The public, finding these silver dollars—"cartwheels"—cumbersome, quickly returned them to the Treasury in payment of taxes. In 1886, Congress allowed these coins to gain circulation "by proxy" through the issue of (paper) silver certificates in denominations of $1, $2 and $5 against coins held by the Treasury. Later, Congress passed the Sherman Silver Purchase Act of 1890, providing for the coining of 4.5 million ounces of silver monthly. While the Bland-Allison Act and the Sherman Silver Purchase Act of 1890 differed in several details, the only substantive difference was the amount of silver currency to be issued per month.

Silver coins and certificates were attempts to utilize silver as a subsidiary monetary metal. This was a form of currency whose value was maintained relative to gold by limitations on its supply, the willingness of the government to receive it at par in payment of taxes, and the suitability of its small denominations for hand-to-hand money. If the policy had been successful, it would have enabled the government to maintain, or even to increase the stock of money in the face of the demonetization of silver worldwide and a number of factors restricting the stock of money within the United States, while maintaining a gold standard.

As long as the new silver coins and certificates resulted only in the disappearance of an equal amount of other small denomination currency, inflation would not result (Taussig 1969, p. 77). However, to the extent silver money, other token money and paper money were added to the money supply of a nation, the credibility of that nation to maintain convertibility would be a continuing concern. Currency speculators, by forcing suspension (and devaluation) through borrowing in the target currency and demanding gold from the

Taussig ref. is missing.

treasury, could chance an enormous profit (paying off a devalued debt) at a small cost (the carrying cost of their speculative position).

The acceptability of silver currency, other token currency and paper currency in payment of taxes would be sufficient to maintain their parity with gold if their supply was insufficient to fully discharge the tax liability, so that some gold would have to be used to pay taxes (Laughlin 1886, p. 253; see also Mitchell 1903). But, as Charles W. Calomiris (1993, pp. 110–11) demonstrates, from 1892 to 1897, customs duties were paid almost entirely in silver, with little gold being tendered to the Treasury. This means that tax-acceptability would not have been sufficient to maintain parity upon suspension. Thus, the ability of the Treasury to actually redeem its paper and silver currency in gold in the face of a speculative run was at issue.

Laughlin is 1885 in ref.?

From a peak of $320 million in 1888, the gold reserve of the Treasury started to fall. Then, with the passage of the Sherman Silver Purchase Act in 1890, the fall accelerated. In 1893, following the Democratic victories of the previous year, a run on the dollar got underway, and the gold reserve hit $189 million. During this period, the Treasury's silver reserve increased by a nearly equal amount (Timberlake 1993, p. 150). This run on the Treasury placed the gold standard in immediate jeopardy.

On June 30, 1893, amidst a financial panic, President Cleveland, an eastern, pro-gold Democrat, called an extraordinary session of Congress to repeal the Sherman Silver Purchase Act of 1890, and thus solidify the gold standard. On October 30, 1893, the repeal was passed (Timberlake 1993, pp. 166–82).

Repeal by itself did not quash the speculative runs on the dollar. In January 1894, the Treasury's gold reserve was substantially restored by the sale of bonds. Following a continuing drain, another sale of bonds was made to restore the Treasury's gold reserve in November 1894. Finally, in late 1894, another run was made on the dollar, which ended in February 1895 when the Treasury entered into an agreement with a syndicate of investment bankers to sell bonds on demand. In 1896, monetary uncertainty revived during the campaign of Bryan on the "cross of gold" issue.

Before proceeding to an examination of how the course of monetary uncertainty was reflected in the yields of gold bonds relative to currency bonds, a discussion of the development of the gold clause is in order.

4. Greenbacks and the Gold Clause

During the period of silver agitation, investors could seek to protect themselves from a possible devaluation of the dollar, through gold bonds. These were bonds that, by contract, promised to pay interest and principal in gold, irrespective of the convertibility of the dollar into gold. These bonds became popular following the issuance of greenbacks during the Civil War, and the subsequent legal tender cases decided by the Supreme Court.

In 1862, with the Civil War underway, Congress passed an act authorizing the issue of United States notes—"greenbacks"—which were to be a legal tender

for all debts, public and private, except customs duties and interest on the public debt, both of which were to be payable in gold. This legal tender act was headed to the Supreme Court the moment President Abraham Lincoln signed it into law.

In 1864, President Lincoln nominated his secretary of the Treasury, Salmon P. Chase, to be chief justice of the Supreme Court. It was Chase who had, under the pressures of wartime finance, proposed the legal tender act to Congress. However, as chief justice, Chase argued that Congress did not have the authority to make paper money into legal tender. In this argument, Chase eventually proved to be in the minority. The Supreme Court ultimately ruled that Congress did indeed have this power, but—and this is the important point as far as this paper is concerned—it also ruled that the legal tender act did not void specific provisions of contracts calling for payment in gold and/or silver. This made the gold clause both enforceable and valuable.

The legal tender decisions began with three preliminaries (Holzer 1980, pp. 9–14). In *Bank of New York v. Board of Supervisors* (1869), the new chief justice argued that New York State could not tax greenbacks because they were not money, which could be taxed by states, but "strictly securities" issued by the federal government and, hence, immune from state taxes. In *Lane County v. Oregon* (1869), he argued that greenbacks could not be forced upon local governments in payment of taxes because the legal tender act had "no reference to taxes imposed by state authority, but relate only to debts in the ordinary sense of the word." In *Bronson v. Rodes* (1869), the court considered a case involving a contract which had specifically required payment in gold or silver. Chief Justice Chase argued that the agreement could not be satisfied by tender of greenbacks of equal nominal value, arguing that there was no express prohibition of such provisions in the legal tender act, and that a specific commitment to pay gold was not a "debt" to which legal tender applied.

These three decisions set the stage for *Hepburn v. Griswold* (1870) or Legal Tender I. *Hepburn* involved a debt that matured five days before the legal tender act was signed, at which time only gold or silver was legal tender. When the creditor sued for payment, the debtor paid in greenbacks. The Supreme Court, in a four to three decision, held that the legal tender act could not apply to contracts made before its passage. Furthermore, Chief Justice Chase argued that the fifth Amendment, which allows the takings of private property only for public use and then only with compensation, protected creditors from the losses which they would suffer when greenbacks were made legal tender. Creditors "are as fully entitled to the protection of this constitutional provision as holders of any other description of property."

The very day Legal Tender I was decided, President Ulysses S. Grant sent two nominations for the Supreme Court to the Senate. Both nominees were on record as favoring the constitutionality of the legal tender act. The reconstituted court immediately called up two cases, *Knox v. Lee* and *Parker v. Davis* (1871) or Legal Tender II, the facts of which were similar to *Hepburn*. The two

new members joined with the three dissenting justices in *Hepburn* to decide that the legal tender act was indeed constitutional and, furthermore, applied to pre-existing contracts.

In the second legal tender decision, the court based its ruling on the "expediency of voiding the legal tender currency," since debts had been contracted "on the understanding that they might be discharged in legal tenders." If the legal tender act were to be declared unconstitutional, "[t]he government would become the instrument of the grossest injustice; all debtors [would be] loaded with an obligation it was never contemplated they should assume." The decision seems absurd since it involved debts contracted *prior to* the passage of the legal tender act, not to debts contracted after greenbacks had been declared by Congress to be legal tender. The concern for equity expressed in Legal Tender II for those who had contracted after greenbacks had been declared by Congress to be legal tender required only that the court declare that a debt is payable in whatever is (understood to be) legal tender at the time the debt is contracted. Thus, debts contracted prior to the passage of the legal tender act would be payable only in gold or silver, and those contracted under the (later discovered to be) unconstitutional legal tender act would be payable in greenbacks (Timberlake 1995, p. 41).

Need source for these quotes.

In 1884, when the Supreme Court considered *Julliard v. Grenman* or Legal Tender III, the court justified greenbacks on the mere basis that "the power to make the notes of the government a legal tender in payment of private debts being one of the powers belonging to other civilized nations, and not expressly withheld from Congress by the constitution." This decision is certainly disheartening to those who view the U.S. Constitution to be a document establishing a government of limited and enumerated powers. But, this decision is not entirely surprising given the decision in Legal Tender II that "expediency" is sufficient reason to violate the received understanding of the Constitution.

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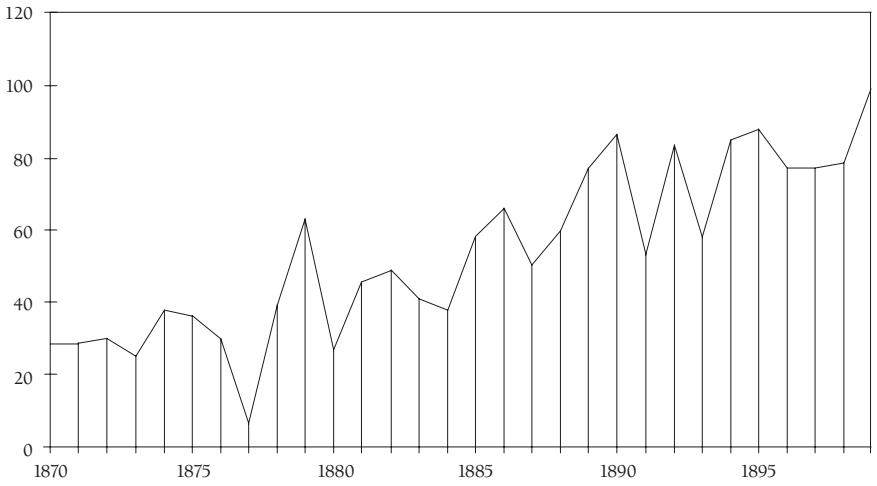
These legal tender cases established the legal status of greenbacks and of the gold clause. Congress could make paper money into legal tender; but a gold clause could, nevertheless, require debtors to pay in gold. Consequently, the gold clause could protect creditors from monetary uncertainty. It is, therefore, understandable that the emergence of silver agitation would make the gold clause a standard feature in long-term bonds. As *The Commercial and Financial Chronicle* (November 28, 1891, p. 1) said, "There are certain essentials which one may expect any carefully-drawn mortgage to contain. Thus, to encompass a possible doubt as to the basis of our monetary system in the future, nearly all new bonds specifically provide for the payment of both principal and interest in gold."

Figure 1 presents the percentage of new issues of railroad bonds that were gold clause bonds during the period 1870–1900, as I have inferred from railroad bonds outstanding from 1889 to 1900 as described in *Poor's Manual*. These bonds do not include bonds that were issued during the period 1870–1888 that matured prior to 1889, were wiped out by reorganizations

Need specific issue of *Poor's*.

prior to 1889, or for some other reason were not outstanding during in 1889. The figure shows that, during the late nineteenth century, the gold clause became increasingly popular and, by the end of the century, did indeed become standard, or nearly universal in new issues.

Figure 1
Percent of New Railroad Bond Issues with gold Clauses, 1870–1900



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5. Estimating the Value of the Gold Clause

While comparing the yields on gold bonds to those on currency bonds would enable investigation of the financial market's assessment of the course of monetary uncertainty through the height of silver agitation, the previously available bond yields are of only limited use. These include the yields on U.S. Treasury gold and currency bonds, and the yields on Macaulay's sample of railroad bonds.

The differential market yields on U.S. Treasury gold and currency bonds are somewhat useful for examining the course of monetary uncertainty during the late nineteenth century. Indeed, these bonds were a major part of Irving Fisher's empirical argument for the incorporation of inflationary expectations into interest rates. Fisher noted that from 1870 to 1878, while the country was on a paper money standard and anticipated deflation to allow resumption at the pre-Civil War parity, the yields on currency bonds were less than those on gold bonds. From 1879 (i.e., after resumption) to 1885, these yields were similar. However, from 1886 to 1896 (i.e., the height of silver agitation),

the yields on currency bonds exceeded those on gold bonds. Following 1896 and the defeat of Bryan, these yields were again similar.

Unfortunately, Fisher's analysis for the silver agitation period was handicapped by infrequent market quotations of Treasury currency bonds during the 1890s. Furthermore, during this period, Treasury bonds were in demand as collateral for the issue of banknotes, and were not priced on an income basis. For example, in 1887, the 4½s of 1891 rose to an average price of 118.5, which price corresponded to a zero yield-to-maturity.[1]

Because of the nonrepresentativeness of yields on Treasury bonds, historical researchers have relied on alternative yields for this period, such as those on high-grade railroad bonds. Frederick R. Macaulay, in *The Movements of Interest Rates, Bond Yields and Stock Prices in the United States Since 1856* (1938), tracks a carefully-selected, evolving sample of long-term, actively-traded, high-grade railroad bonds. On pages A5–A16, Macaulay gives complete descriptions of the bonds in his sample, including whether they were currency or gold bonds; and, on pages A34–A107 gives the yields of these bonds on a monthly basis. While he states, it is "virtually impossible to discover pairs of important bonds identical or nearly identical in all aspects save their media of payment" (p. 201), it should be possible, today, with modern statistical techniques, to distinguish between the yields on similar, but not completely identical currency and gold bonds.

Since Macaulay's sample is exclusively of long-term bonds, the effect of silver agitation on the yields of currency bonds can be illustrated with the formula for perpetuities; i.e., $Y = C/P$, where Y is yield, C coupon rate and P market price. Suspension would cause a fall in the price of currency bonds relative to gold bonds, and speculation concerning suspension would lower price and raise yield immediately. However, the average yield on the currency bonds in Macaulay's sample is not statistically different from the average yield on the gold bonds in his sample during the period 1890–1896 (when the yield on the gold bonds would be expected to be lower). And, in 1889 and 1897, the average yield on the currency bonds is lower (when the yields would be expected to be similar). This curious pattern can be easily explained by variation in the quality of bonds being correlated with their media of payment in Macaulay's sample.

I should point out that Macaulay was not concerned that all the bonds in his sample have the same high quality, but only that they were of reasonably good quality.[2] This was because he constructed his index of "high quality"

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[1]Because of this demand as legal collateral, Peter M. Garber's (1986, table 3, p. 1023) calculations of the theoretical value of the Treasury's currency bonds are probably irrelevant for the last two decades of the nineteenth century. Indeed, the actual prices he reports for currency bonds, from 1884 to 1891, are higher than the value he estimates for them if they were gold bonds.

[2]In the early twentieth century, when bond ratings came to be published by *Moody's* and by *Poor's*, all of the bonds in Macaulay's sample are rated AAA/Aaa or AA/Aa

railroad bond yields by adjusting the average yield of the bonds in his sample so it equaled the level of the highest-quality (i.e., lowest-yielding) bonds in his sample, while tracking the movements of the average yield in his sample. Thus, on pp. A142–A161, he gives both the average yield of the bonds in his sample (column 4), this number being affected by default risk, and the adjusted average yield (column 5), this number being substantially free of default risk. A researcher concerned for uniformity of quality in his sample of bonds would have to be more precise than was Macaulay in identifying the highest quality, long-term railroad bonds of the late nineteenth century.

In order to construct a sample of bonds substantially free of default risk for the period 1889 to 1897, for each year, I first calculated the average yield-to-maturity of every actively-traded railroad bond with at least eight years and no more than 100 years term-to-maturity.[3] I then averaged the yields of the third, fourth, and fifth lowest yields among the currency bonds, and among the gold bonds. I then identified all the currency bonds and all the gold bonds whose yields consistently were no more than one-half percentage point, or 50 basis points, higher than these base rates. With one qualification, this process generated the sample presented in the table found in the Appendix.

Before describing the one qualification, a few things should be said about the sample. First, the sample consists almost exclusively of the best-secured bonds of large, financially-strong railroad companies operating in the northeast and the upper-midwest regions of the country. Of the 125 bonds, almost half are obligations of the Pennsylvania and the New York Central systems, and almost all the others are obligations of the Boston & Maine; Central RR of New Jersey; Chicago & Alton; Chicago & North Western; Chicago, Burlington & Quincy; Chicago, Milwaukee & St. Paul; Chicago, Rock Island & Pacific; Delaware & Hudson; Delaware, Lackawanna & Western; Illinois Central; Lehigh Valley; and, Long Island railroads.

Second, the few bonds in the sample issued by financially-weak corporations are the well-secured first mortgage bonds of the Baltimore & Ohio; Erie; and, Philadelphia & Reading railroads. Indeed, these bonds continued to pay

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(indeed, he had access to these ratings in assembling his sample). But, the railroad industry of the late nineteenth century was much different from the railroad industry of the early twentieth century. In particular, the completion of the railroad network, the consolidation of operating companies, the reorganizations of financially-weak roads, the emergence of a strong investment banking industry, rate regulation by the Interstate Commerce Commission, and the growing acceptance of railroad bonds by trustees can be cited as increasing the quality of railroad debt. Macaulay notes that his (adjusted) index of railroad bond yields drifts downward relative to his index of New England municipal bond yields during the period 1857 to 1914, and attributes the diminishing differential to increasing acceptance of railroad bonds by trustees and other very conservative investors (pp. 120–21).

[3]I obtained monthly high and low sales prices for the Baltimore, Boston, New York and Philadelphia stock exchanges from annual editions of *Financial Review*, which was published by the *Commercial and Financial Chronicle*, and bond descriptions from annual editions of *Poor's Manual*.

interest, as did at least one tier of bonds junior to them, when the companies fell into receiverships during the 1890s. The few bonds in the sample issued by railroad companies operating outside the northeast and the upper-midwest regions of the country are the well-secured first mortgage bonds of the Chesapeake & Ohio; and Missouri Pacific companies, whose operating territories bordered on the northeast and upper-midwest regions of the country.

Third, my sample differs from Macaulay's sample in only two ways. My sample includes some less actively-traded bonds that Macaulay's sample does not include. And, Macaulay's sample includes a few lower-quality bonds that my sample does not include, e.g., the Hannibal & St. Joseph consolidated mortgage 6s of 1911. (Removing these lower-quality bonds from the sample eliminates the counter-intuitive finding with Macaulay's sample, discussed above, that gold bonds sold at a discount relative to currency bonds in 1889 and 1897, and did not sell at a premium from 1890 to 1896.)

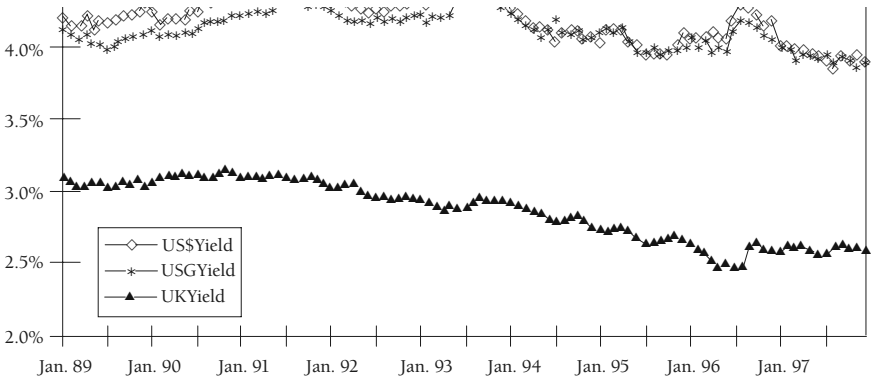
Finally, to address my one qualification, it is that during the last two years of the sample, I only added bonds that, in addition to meeting the yield criterion, logically belonged in the sample because of their priority of claim relative to other bonds already included in the sample. For example, I included the Pittsburg, Cincinnati, Chicago and St. Louis consolidated "C" and "D" series bonds since the "A" and "B" series bonds were already included in the sample.

Should it be Pittsburgh?

6. Currency and Gold Bond Yields

Figure 2 presents the average yield of the currency and gold bonds included in my sample during the period 1889–1897, juxtaposed against the average yield on the debenture stocks of seven leading British railroads, which were very well-secured perpetuities (Klovland 1994).

Figure 2
Railroad Bond Yields, 1889–1897



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While the yields on the highest quality American and British railroad securities exhibit a similar long-run trend during this period, two differences are evident: first, the American yields are at a higher level; and, second, the American yields periodically rise from the long-run trend. The first observation (that the American bond yields were higher) was well-known. S.F. Van Oss (1893, p. 180), for example, wrote at the time, "the credit of American bonds is as a rule from one-half to one per cent below the point to which they are fairly entitled." Milton Friedman and Anna J. Schwartz (1963) argue that the higher American interest rates reflected expectations of inflation in the United States (because, e.g., of the risks of suspension or of a switch to silver), which in fact because of deflation resulted in debt being quite burdensome in this country during the latter half of the 19th century. The second observation—the periodic rise of the American yields from their apparent long-run trend during the height of silver agitation—is the concern of this paper.

The American yields peak three times: The first peak is from 1889 to 1890, the second from 1892 to 1893, and the third from 1895 to 1896. All three times, yields on American currency bonds rise by more than yields on American gold bonds rise. The first peak—1889 to 1890—reflected the increasing political pressure to "do something" for silver, culminating in the passage of the Sherman Silver Purchase Act of 1890, along with the Baring Crisis which caused British investors to dump foreign investments of all kinds. The second peak—1892 to 1893—reflected the crisis associated with the run on the U.S. Treasury's gold reserve. Then, following the repeal of the Sherman Silver Purchase Act of 1890, American yields fell sharply, and the difference between the yields on American currency and gold bonds appears to have been wiped out. The third peak—1895 to 1896—reflected the 1996 presidential campaign of Bryan.

Should it be Pittsburgh?

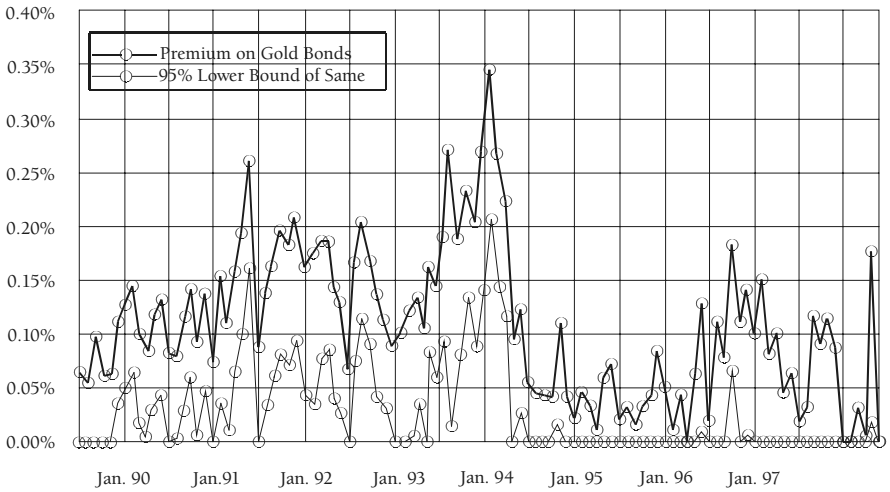
Comparing the yields on American currency bonds with those on American gold bonds, an initially small difference appears to grow slowly through 1893, at which time it grows sharply. Following 1893, this difference appears to shrink to nothing. A small difference reappears in 1896, following which it again shrinks to nothing.

To see if these differences are statistically significant, I conducted monthly cross-section regressions in which the yield of a bond is viewed as a function of its medium of payment and term-to-maturity (given that all bonds in the sample have at least eight years term-to-maturity).[4] Figure 3 displays

[4]Specifically, for bond i, $y_i = \beta_0 + \beta_1 x_{1i} + \beta_2 x_{2i} + e_i$, where y_i is yield, x_{1i} is a zero-one variable denoting gold bonds, x_{2i} equals (12 - term-to-maturity)/4 if term-to-maturity is less than 12, and otherwise equals zero, and e_i is an error term. As the term-to-maturity variable was often insignificant, the regressions were practically difference-of-means tests. I checked a variety of other potential contributors to yield, including sinking fund provision subject to, and not subject to random draw, call provision, registered versus coupon bond, and the exchange at which the sale occurred, without consistent, statistically-significant and economically-logical results. (I should point out that I had only one bond in the sample with a sinking fund provision subject to random draw, and only one with a call

the estimates of the reduction of yield achieved with the gold clause, and (one-way) 95 percent lower bounds (i.e., the point estimate less 1.65 times its standard error).

Figure 3
Gold Bond Yield Differential, 1889–1897



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During the first five months of 1889, the coefficient representing the contribution of the gold clause to yield averages seven basis points, and does not achieve statistical significance. From June 1889 to January 1893, this coefficient fluctuates between 8 and 26 basis points, and sometimes achieves statistical significance. From February to December 1893, the coefficient ranges from 18 to 34 basis points, and usually achieves statistical significance. Following the peak, the coefficient quickly falls to zero, and is totally insignificant from January 1894 to November 1895. From December 1895 to June 1896, the coefficient mostly fluctuates between 8 and 18 basis point, and only sometimes achieves statistical significance. From July 1896 to December 1897, the coefficient appears to be zero.

These results are comparable to those of Calomiris (1993, pp. 115–16) contrasting commercial paper rates in New York (i.e., short-term currency interest rates) with the ratio of "sight" and 60-day bills of exchange on London banks (i.e., implicit short-term gold interest rates) over the period 1893–1896.

provision.) I presume that the insignificance of such variables reflects the criterion I used to form my samples, which forced all the bonds to be the lowest yielding bonds within their media-of-payment category.

He finds that the gold premium reached a peak of 2 percent in June 1893, fell essentially to zero after that, and then reached a modest peak of 1 percent in August 1896. As he explains, the 2 percent figure of June 1893 represents a combination of the subjective probability of suspension and the expected fall in the value of the dollar upon suspension; e.g., a 20 percent chance of suspension and an expected 10 percent fall in the value of the dollar upon suspension.

My estimates, while comparable to those of Calomiris, pertain to long-term bond yields, and therefore can reflect concern for a wider range of possibilities, including a switch to silver, a paper dollar (e.g., a protracted suspension), and perhaps even debt repudiation, as well as a temporary suspension of convertibility. My highest estimate of the gold premium on long-term bonds of 34 basis points in August 1893, given the level of yields, implies a combined subjective probability of suspension and expected fall in the value of the dollar upon suspension of 8 percent. This implies that the bond market expected a substantial fall in the dollar upon suspension. For example, if we assume that in August 1893 the subjective probability of suspension was 40 percent, then the expected fall in the value of the dollar upon suspension would have been 20 percent.

If France and the other silver and bimetallic countries of the world had not switched to gold during the late 19th century, it is not unreasonable to suppose that the ratio decreed by the United States, 16 to 1, would have become determinant upon the effective shift of France and the Latin Union to silver and resumption in the United States. In such a case, the fall in the value of the dollar (and the franc) would have been only 3 percent relative to gold. About all that would have happened is that the role formerly played by France in stabilizing the exchange rate between silver and gold (in absorbing the glut of whichever metal was overvalued) would have been assumed by the United States at a slightly lower value of silver relative to gold. It might even be argued, as Drake (1985) and Friedman (1993) do, that if the United States had resumed convertibility on the basis of a bimetal standard, the period would have been characterized by a more stable dollar.

Friedman is 1992 in ref.

However, given that France and several other silver and bimetallic countries had switched to gold, and that the several attempts during the period to gain international cooperation in the restoration of full monetary status for silver had failed, the informed opinion at the time was that free silver in the United States would have meant a substantial fall in the value of the dollar, and furthermore a freely-floating dollar relative to gold. The shift of money originally from silver eventually to gold involved bungled attempts by various governments to establish bimetallic standards during the late eighteenth and early nineteenth centuries (Mises 1966, pp. 471–72). It might, in theory, have been possible to establish and maintain a viable bimetallic standard and, thus, maintain a monetary role for silver that was something more than subsidiary coinage. But, by the late nineteenth century, informed opinion was otherwise.

7. The 1896 Presidential Campaign

The modest differences between the yields of currency and gold bonds during 1896 might be considered curious given the call of the Democratic Party's nominee for president, and of its national platform for free silver. The political events of that year were enormously exciting. Bryan, nicknamed "The Lion of Nebraska," drew enormous crowds, which he whipped into a frenzy. The Republican candidate, William McKinley, in contrast, merely conducted a "front porch campaign," consisting mostly of speaking to relatively small groups of people assembled in front of his home by his campaign managers.

Even without public opinion polls, it became clear before the election that the Republicans would win. Rhode and Strumpf (2004, p. 130), assembling historical betting data on U.S. presidential elections, show that the Republican nominee was a strong favorite by 31 days prior to the election, and a prohibitive favorite during the fifteen days prior.

In October, the *New York Times* (which supported the gold standard) said "the indications unmistakenly foreshadowed the defeat of the silver party, but nevertheless a feeling of great nervousness and anxiety prevailed." On the Sunday before the election, the *Times* indicated "that McKinley will secure the electoral votes of from twenty-five to twenty-eight states with reasonable certainty." Regarding the Congress, "a majority in House . . . was assured a long time ago," and "even the Senate might switch to sound money." Nevertheless, on the Monday before the election, the *Times* reported a long line of people at the Treasury office in New York seeking to convert greenbacks into gold, and even people withdrawing currency from their bank accounts. On the day of the election, the *Times* reported "the financial world entertains no doubt about the election. . . . About the only quotation on the whole list that declined was that for silver." While some people were going bananas, the smart money had already figured things out.

Need more ref. info such as dates, titles, etc., for this paragraph.

In hindsight, the gold standard could be said to have been *secured* by the capture of the Democratic Party by its populist wing. Prior to 1896, the major political parties had each been divided on the subject. Skillful politicians, aspiring to national leadership, therefore shaded their own positions, and supported compromise legislation such as the Sherman Silver Purchase Act of 1890. Indeed, the real challenge to the gold standard was the gradual but cumulative effects of such compromise legislation in undermining the gold standard. Thus, once the Democrats clearly committed themselves to free silver, as well as to a long list other radical ideas, victory was assured for the Republicans and the gold standard.

8. Summary and Concluding Remarks

During the late nineteenth century, when silver agitation threatened the gold standard in the United States, gold bonds offered investors some protection from the uncertainties concerning the monetary standard in the United

States. Gold bonds, therefore, sold at a premium relative to similar currency bonds. This premium can be used to examine the degree to which the financial markets were concerned for the gold standard during the tumultuous 1890s. Care must be taken in assembling samples of gold and currency bonds, with which to track the premium on gold bonds, so that only bonds of uniformly high quality are included in the samples.

The yields on gold and currency bonds constructed in this paper support some views of this period of history, e.g., that the financial markets were very concerned about the commitment of the United States to maintain the gold standard during 1893; and, they challenge some others, e.g., that the financial markets were similarly concerned during 1894 and 1895 when the Treasury was being forced by continuing runs to actively defend the dollar. I think we can say that the informed opinion of the time was President Cleveland, by obtaining a repeal of the Sherman Silver Purchase Act of 1890, had secured the gold standard in this country. What remained to be done, namely, thwarting the several subsequent runs on the Treasury, would be doable.

A perhaps troubling finding of this study is that while well-secured gold bonds issued by U.S. railroads were priced at a premium relative to similar currency bonds, both were priced at a substantial discount relative to well-secured issues of British railroads. As I mentioned in the body of this paper, that the yields on American securities were relatively high was well-known at the time.

Among the possible explanations for this high yield is that it was never clear that the gold clause enjoyed a constitutional guarantee. To illustrate, in 1893, as the Treasury's gold reserve was falling, and a rumor was about that the gold clause had been declared invalid, *The Commercial and Financial Chronicle* quoted from the Sherman Silver Purchase Act of 1890 that silver coins and certificated were to be "a legal tender in payment of debts public and private, *except where otherwise expressly stipulated in the contract*."[5] That Congress did not try to disturb the gold clause does not mean that it could not if it chose to do so.[6] If the financial markets suspected that the gold clause hinged only on the will of Congress, then a constitutionally-guaranteed gold clause could have been more effective in lowering the cost of capital in the United States, by allaying concerns for monetary uncertainty.

[5]January 14, 1893, p. 53; emphasis added.

[6]In fact, from 1933 to 1977, the gold clause and all other forms of indexation were banned in the United States (McCulloch 1980).

APPENDIX.
THE RAILROAD BOND SAMPLE

Table 1
Months During Which Sales Took Place of Bonds in the Sample

Name	Ex	Sys	'89	'90	'91	'92	'93	'94	'95	'96	'97
Albany & Susquehanna 1st 6s 1906	1	D	12	9	11	11	11	7	9	3	9
Albany & Susquehanna 1st 6s 1906 R	1	D	0	2	6	7	2	0	3	4	2
Albany & Susquehanna 1st 7s 1906	1	D	4	9	10	8	9	8	6	1	3
Allegheny Valley gen 4s 1942	3	P				6	4	10	2	2	4
American Dock & Improvement 1st 5s 1921	1	J			12	12	11	12	10	12	11
Baltimore & Ohio 1st 4s 1935	4	B	5	10	8	9	7	7	7	9	8
Baltimore & Potomac 1st 6s 1911	4	P	1	1	6	6	3	6	7	3	2
Baltimore & Potomac Tunnel 6s 1911	4	P	2	2	3	2	5	3	2	3	1
Beech Creek 1st 4s 1936	1	C		11	11	8	10	9	8	9	6
Beech Creek 1st 4s 1936 R	1	C		0	0	5	1	1	0	0	0
Belvidere Delaware cons 4s 1925	3	P	3	3	2	4	3	1	0	4	3
Buffalo & Erie 1st 7s 1898	1	C	7	11							
Central RR of New Jersey cons 7s 1899	1	J	12	11	8						
Chesapeake & Ohio Purch Money 6s 1898	1	H	7	5							
Chicago & Alton sf 6s 1903	1	A	6	8	6	7	7	6	7		
Chicago & Milwaukee 1st 7s 1898	1	N	8	3							
Chicago & North Western cons 7s 1915	1	N	12	11	12	12	11	12	12	11	12
Chicago & North Western Ext 4s 1926	1	N	11	12	10	12	10	9	9	8	11
Chicago & North Western gen 7s 1902	1	N	12	12	12	12	12	11			
Chicago & North Western gen 7s 1902 R	1	N	11	12	12	8	9	9			
Chicago Burlington & Quincy cons 7s 1903	1	Q	12	12	12	12	12	12	12		
Chicago Burlington & Quincy cons 7s 1903	2	Q	11	11	12	11	12	12	12		
Chicago Burlington & Quincy Denvr 4s 1922	1	Q	12	12	11	10	8	10	10	11	9
Chicago Burlington & Quincy Denvr 4s 1922	2	Q	10	11	12	12	10	11	11	10	11
Chicago Burlington & Quincy Iowa 4s 1919	1	Q	12	12	11	12	12	11	10	11	11
Chicago Burlington & Quincy Iowa 5s 1919	1	Q	5	3	7	3	5	1	2	4	3
Chicago Burlington & Quincy Nebr 4s 1927	1	Q	12	12	12	12	12	12	12	12	12
Chicago Milw & St Paul Chic & Pac 5s 1921	1	S			12	12	12	12	12	12	12
Chicago Milw & St Paul gen 4s 1989	1	S		11	12	11	7	12	12	12	12
Chicago Rock Island & Pac 1st 6s 1917	1	Y	12	12	12	11	11	12	12	5	12
Chicago Rock Island & Pac 1st 6s 1917 R	1	Y	5	7	8	7	7	7	7	8	6
Chicago St Louis & New Orl 1st 7s 1897	1	I	10								
Chicago St Louis & New Orl cons 5s 1951	1	I	12	7	9	12	11	10	10	11	7
Chicago St Louis & New Orl Mem 4s 1951	1	I	6	9	2	7	6	4	1	1	2
Cincinnati Ind St Louis & Chic gen 4s 1936	1	C	12	12	9	12	10	9	11	9	9
Cleveland & Pittsburgh cons 7s 1900	1	P	9	10	10	9	6	4	7	6	4
Cleveland Columbus Cin & Ind 1st 7s 1899	1	C	9	10	11	12					
Delaware & Bound Brook 1st 7s 1905	3	R	10	5	3	7	6	5	6	3	5
Delaware & Hudson Penn Div 7s 1917	1	D	10	9	6	7	4	6	2	7	3
Delaware Lackawanna & Wes cons 7s 1907	1	K	9	5	7	10	3	10	5	3	2
Eastern (MA) 6s 1906	2	Z	11	11	12	12	12	11	11	10	12
Easton & Amboy 1st 5s 1920	3	L	7	9	9	11					
Elmira & Williamsport 1st 6s 1910	3	P	4	5	1	2	4	4	6	4	5
Illinois Central 1st 3½s 1951	1	I	11	11	9	8	5	8	9	1	1
Illinois Central 1st 4s 1951	1	I	12	9	9	4	9	6	7	5	1

Months during which sales took place of bonds in the sample (continued).

Bond	Ex	Sys	'89	'90	'91	'92	'93	'94	'95	'96	'97
Illinois Central col tr 4s 1952	1	I	11	9	12	12	10	7	4	11	1
Illinois Central Western Lines 4s 1951	1	I							8	10	11
Lake Erie & Western 1st 5s 1937	1	C			12	12	11	12	12	12	11
Lake Shore & Michigan Sou 1st 7s 1900	1	C	12	11	11	11					
Lake Shore & Michigan Sou 1st 7s 1900 R	1	C	10	12	11	11					
Lake Shore & Michigan Sou 2nd 7s 1903	1	C			12	12	12	12	11		
Lake Shore & Michigan Sou 2nd 7s 1903 R	1	C			11	12	12	11	10		
Lehigh Valley 1st 7s 1898	3	L	10	12							
Lehigh Valley 1st 7s 1898 R	3	L	11	11							
Lehigh Valley 2nd 7s 1910 R	3	L	11	11	12	11	12	11	10	11	11
Long Island 1st 7s 1898	1	G	8	8	10						
Long Island cons 5s 1931	1	G	9	12	10	10	9	7	8	6	6
Long Island gen 4s 1938	1	G	12	12	12	12	12	12	12		
Michigan Central cons 5s 1902	1	C	7	12	9	10	8	5			
Michigan Central cons 7s 1902	1	C	12	12	12	12	12	12			
Michigan Central Det & Bay City 5s 1931	1	C	7	5	6	7	9	7	7	4	4
Michigan Central Det & Bay City 5s 1931 R	1	C	4	3	10	0	4	1	3	1	1
Milwaukee Lake Shore & Wes 1st 6s 1921	1	N				12	12	12	11	9	12
Morris & Essex 1st 7s 1914	1	K	12	9	11	11	11	11	11	12	10
Morris & Essex cons 7s 1915	1	K	11	12	11	9	8	12	11	11	11
Morris & Essex constr 7s 1901	1	K	11	10	9	3	4	9	9	4	5
New Jersey Junction 1st 4s 1986	1	C	8	2	3	5	1	2	1	2	1
New York & Erie 2nd 5s 1919	1	E	6	9	5	6	8	6	6	5	6
New York & Erie 3rd 4½s 1923	1	E	6	10	7	7	4	10	9	8	8
New York & Erie 4th 5s 1920	1	E	8	9	4	6	6	8	9	3	6
New York & Erie 5th 4s 1928	1	E	10	8	5	4	1	7	8	2	3
New York & Harlem 1st 7s 1900	1	C	6	9	12	11					
New York & Harlem 1st 7s 1900 R	1	C	9	8	8	10					
New York Central 1st 7s 1903	1	C	12	12	12	12	12	12	12		
New York Central 1st 7s 1903 R	1	C	11	10	10	10	9	12	8		
New York Central 4% debt certificates	1	C					11	9	12	11	9
New York Central 4% debt certificates R	1	C					3	3	3	5	2
New York Central deb 4s 1905	1	C			11	7	2	6	0	4	8
New York Central deb 4s 1905 R	1	C			1	1	0	2	0	4	4
New York Central deb 5s 1904	1	C	12	10	12	11	12	11	12	12	
New York Central deb 5s 1904 R	1	C	5	3	8	7	10	9	10	10	
New York Chicago & St Louis 1st 4s 1937	1	C	12	12	12	12	12	12	12	12	12
New York Lackawanna & W 1st 6s 1921	1	K	11	10	9	10	12	9	10	9	6
New York Lackawanna & W constr 5s 1923	1	K	12	10	7	10	10	6	6	6	6
Northern Central 1st 6s 1900	3	P	5	5	5	5					
Northern Central 1st 6s 1900	4	P	6	6	8	8					
Northern Central 2nd 6s 1900	4	P	10	11	12	12					
Northern Central cons 4½s 1925	3	P	2	2	2	0	0	0	1	1	1
Northern Central cons 4½s 1925	4	P	8	7	2	4	7	2	3	5	3
Northern Central cons 6s 1904	3	P	3	1	3	0	2	1	3	3	

Months during which sales took place of bonds in the sample (continued).

Bond	Ex	Sys	'89	'90	'91	'92	'93	'94	'95	'96	'97
Northern Central cons 6s 1904	4	P	9	9	8	7	4	2	5	5	
North Pennsylvania 1st 4s 1936	3	R									3
North Pennsylvania gen 7s 1903	3	R	6	7	5	8	5	10	8		
North Pennsylvania gen 7s 1903 R	3	R	7	9	6	6	7	7	6		
Pacific RR of Missouri 1st 4s 1938	1	M	12	12	12	12	12	12	12	10	12
Pennsylvania & NY Canal 1st 7s 1906	3	L	8	8	7	7	4	9	6	5	5
Pennsylvania & NY Canal cons 4½s 1939	3	L								1	2
Pennsylvania & NY Canal cons 4s 1939	3	L		2	1	2	2	5	3	2	3
Pennsylvania & NY Canal cons 5s 1939	3	L	8	5	3	4	3	6	11	7	7
Pennsylvania Co col tr 4½s 1921	1	P	12	12	12	12	12	11	12	12	12
Pennsylvania Co col tr 4½s 1921 R	1	P	5	8	7	9	7	10	7	4	9
Pennsylvania RR col tr 4½s 1913	3	P	4	3	10	5	3	1	3	6	7
Pennsylvania RR col tr 4s 1921	3	P	12	12	12	12	12	12	12	11	12
Pennsylvania RR cons 5s 1919	3	P	4	4	6	4	10	5	5	2	2
Pennsylvania RR cons 5s 1919 R	3	P	5	5	5	3	2	4	3	4	3
Pennsylvania RR cons 6s 1905	3	P	8	10	11	12	8	10	11	11	9
Pennsylvania RR cons 6s 1905 R	3	P	4	4	4	4	3	10	7	6	7
Pennsylvania RR gen 6s 1910	3	P	10	12	11	11	11	8	7	11	10
Pennsylvania RR gen 6s 1910 R	3	P	9	11	12	10	12	11	11	11	8
Philadelphia & Erie gen 4s 1920	3	P	12	12	9	12	11	9	8	9	10
Philadelphia & Erie gen 5s 1920	3	P	12	9	12	11	12	8	10	7	10
Philadelphia & Reading 1st 6s 1910	3	R	5	1	1	5	4	4	2	2	1
Philadelphia Wilmington & Balt deb 4s 1917	3	P	2	3	1	3	3	8	2	1	3
Pitt Cin Chic & St Louis cons "A" 4½s 1940	1	P			1	8	12	11	12	10	9
Pitt Cin Chic & St Louis cons "B" 4½s 1942	1	P				1	7	11	10	10	10
Pitt Cin Chic & St Louis cons "C" 4½s 1942	1	P								4	0
Pitt Cin Chic & St Louis cons "D" 4s 1945	1	P								4	3
Pitt Ft Wayne & Chicago 1st 7s 1912	1	P	7	9	10	11	8	9	10	2	7
Pitt Ft Wayne & Chicago 2nd 7s 1912	1	P	7	10	3	7	4	4	6	1	0
Rensselaer & Saratoga 1st 7s 1921	1	D	7	5	3	4	6	2	3	4	7
Rensselaer & Saratoga 1st 7s 1921 R	1	D	3	1	1	0	5	2	0	2	0
Rome Water & Ogdensburg cons 5s 1922	1	C				11	12	12	12	11	1
Sunbury & Erie 1st 7s 1897	3	P	2								
Syracuse Binghamton & NY 1st 7s 1906	1	K	8	6	1	8	4	7	1	0	12
West Jersey 1st 7s 1899	3	P	8	6	8						

R (at end of name): Registered Bond (otherwise Coupon Bond)

Ex: 1=New York Stock Exchange, 2=Boston, 3=Philadelphia, 4=Baltimore.

Sys: A=Chic. & Alton, B=Baltimore & Ohio, C=New York Central, D=Delaware & Hudson, E=Erie, G=Long Island, H=Chesapeake & Ohio, I=Illinois Central, J=Central of New Jersey, K=Lackawanna, L=Lehigh, M=Missouri Pacific, N=Chic. & North Western, P=Pennsylvania, Q=Chic., Burl. & Quincy, R=Reading, S=Chic., Milw. & St. Paul, Y=Chic., Rock Island & Pac., Z=Boston & Maine.

REFERENCES

Bordo, Michael D. 1987. "Bimetallism." In *The New Palgrave: A Dictionary of Economics*. John Eatwell, Murray Milgate and Peter Newman, eds. London: Macmillan. Pp. 243-45.

Calomiris, Charles W. 1993. "Greenback Resumption and Silver Risk: The Economics and Politics of Monetary Regime Change in the United States, 1862–1900." In *Monetary Regime Transformations*. Michael D. Bordo and Forest Capie, eds. London: Cambridge University Press. Pp. 86–132.

Commercial and Financial Chronicle. November 28, 1891 and January 14, 1893.

Drake, L. 1985. "Reconstruction of a Bimetallic Price Level." *Explorations in Economic History* 22: 194–219.

Financial Review, various issues.

Friedman, Milton. 1992. *Money Mischief*. New York: Harcourt Brace Jovanovich.

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

Garber, Peter M. 1986. "Nominal Contracts in a Bimetallic Standard." *American Economic Review* 76: 1012–30.

Holzer, Henry Mark. 1980. *The Gold Clause*. New York: Books in Focus.

Kindleberger, Charles P. 1985. *A Financial History of Western Europe*. London: Allen and Unwin.

Klovland, Jan Tore. 1994. "Pitfalls in the Estimation of the Yield on British Consols, 1850–1914." *Journal of Economic History* 54: 164–87.

Laughlin, J. Lawrence. 1885. *The History of Bimetallism in the United States*. New York: Appleton.

Macaulay, Frederick. 1938. *The Movements of Interest Rates, Bond Yields and Stock Prices in the United States Since 1856*. New York: National Bureau of Economic Research.

McCulloch, J. Huston. 1980. "The Ban on Indexed Bonds." *American Economic Review* 70: 1018–21.

Mises, Ludwig von. 1966. *Human Action*, 3rd Ed.. Chicago: Henry Regnery.

Mitchell, Wesley C. 1903. *A History of the Greenbacks*. Chicago: University of Chicago Press.

The New York Times, various issues.

Poor's Manual of Railroads, various issues.

Rhode, Paul W., and Koleman S. Strumpf. 2004. "Historical Presidential Betting Markets." *Journal of Economic Perspectives*. 18: 127–42.

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

——. 1991. "The Political Origin and Judicial Sanction of Legal Tender Paper Money in the United States." pp. 31-56. In *Money and Banking: The American Experience*. John Robbins, ed. Fairfax, Vir.: George Mason University Press.

——. 1978. "Repeal of Silver Monetization in the Late Nineteenth Century." *Journal of Money, Credit and Banking* 10: 27–45.

Are there titles for these articles?

Need specifics.

Need specifics.

Unger, Irwin. 1964. *The Greenback Era: A Social and Political History of American Finance, 1865–1879*. Princeton, N.J.: Princeton University Press.

Van Oss, S.F. 1893. *American Railroads as Investments*. New York: G.P. Putnam's Sons.