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JP Morgan: the Reluctant Central Banker

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Chapter Six: Morgan as LOLR during The Run on the Treasury in 1895

Economic and financial chaos overwhelmed Europe and the US in the 1890s. The Barings Brothers in the UK and the brief Panic of 1890 in the US set the stage for the disaster that was to blow up in the Panic of 1893. It swept across the US in waves, rivalling the Great Depression. In the real sector, output contracted, and unemployment expanded; all the while exports faltered. Banking was repeatedly interrupted as runs on deposits ignited in the interior in Chicago and spreading to California (Wicker 2000). Meanwhile, the bankers in New York looked on with some disdain, with their Clearing House finally authorizing the use of Clearing House loan certificates in July. This was done out of prudence just in case the panic spread to the city through the intensifying demands of their correspondent banks. The specter of bimetallism in the US only added to the financial uncertainty. JP Morgan watched all of this with concern, as he was increasingly preoccupied with a symptom of the financial disruption, the Treasury's dwindling stock of gold coin and specie.

The sources of the Treasury's dwindling gold stock included weakening US railroad bonds, declining exports, and increasing concern over the widespread monetization of silver in the US and the move to a bimetallic monetary standard. These had led to the widespread liquidation of US securities, both domestically and overseas European investors shipped the proceeds from bond liquidations back home in the form of gold, domestic bankers hoarded gold from the sales of securities stateside and US importers paid less gold to the US Treasury for tariffs on imports. The US Treasury needed gold to maintain convertibility of notes, confidence in Treasury bonds payable in gold, and the fixed exchange rates implied by the statutory convertibility of the dollar into gold. But without a formal central bank to organize lender of

last resort tasks in the US it fell to President Grover Cleveland and Treasury Secretary John G. Carlisle to defend the US Treasury's gold reserves and preserve the US commitment to pay its foreign obligations in gold.

Morgan's own business was not insulated from the turmoil surrounding the Treasury's gold reserves. Between 1886 and 1895, six of Morgan's most important railroad customers were forced into receivership when cash flows from shipping commodities did not cover expenses. He was consumed with reorganizing the debt contracts so that his investors would ultimately receive the principal and interest they had been promised. The impact of the reorganizations and of the decline in railroad bond prices, however, affected him acutely. His firm lost over a million dollars in 1893, the largest loss in its 35-year history to that point, after having managed to be profitable in 1891 and 1892. If the US went off the gold standard in 1894 or 1895, it might have presented the final blow to his investors' confidence in the bonds he underwrote and in which they were heavily invested. (See Figure A.)

Under these conditions it is not surprising that Morgan stepped in to coordinate lender of last resort activities in the US. Morgan's involvement was important because the existence of a lender of last resort in the advancing countries in the Nineteenth Century was not a given. ~~Both~~ Neither the US nor Canada had ~~not~~ established a central bank, but many other societies had decided to do so. The first was Sweden in 1668, followed by others including England in 1694 and France in 1800. The existence of a lender of last resort in the form of a central bank was at its heart a bargain struck by the legislative and executive branches of government. The bargain allowed the legislature to create a centralized, domestic, and international payments

system, a public good. The judicial branch would settle disputes among agents in the system (Calomiris and Haber, 2015).

From time to time, the payments system was threatened by panic in the market for deposits, with the supply of funds and the demand for funds not reaching equilibrium and the payments system ceasing operation. In countries lacking a central bank, gains and losses accrued to private agents in periods of payments system failure. Gains could be reaped by agents who supplied liquidity at a high rate to borrowers who demanded it if borrowers paid it back. Losses accrued to agents who provided liquidity at a high rate to borrowers who could not pay it back.

British and French societies chose to reduce the risk of loss and chance for gain in times of imbalance by creating central banks. In those two societies, the legislative and executive branches of government agreed to delegate the task of resolving market failures to a group of central bankers who could allocate a centralized supply of reserves to distressed agents when no other lender was willing, that is when there was no equilibrium lending rate that would compensate the typical lenders for perceived risks. Gains from making such a loan would not accrue to private lenders but rather to the central bank. Losses if any from making such a loan would also accrue to the central bank. The removal of opportunity for private gains and losses would assure society that the loans of last resort were being made to maximize the public good, not private gain at the expense of the public.

Americans chose a different arrangement. The legislative branch, the Congress, agreed with the executive branch, the U.S. Treasury, to structure a decentralized, fragmented

payments system; and responses to a crisis or panic tended to be ad hoc, unlike in Britain and France. The US produced copious quantities of silver, and this complicated any plan to combat a crisis, especially those involving European financiers who were clearly on the gold standard. U.S. legislators whose constituents hailed from silver-mining states insisted on a bi-metallic monetary system.¹ The Treasury had to accommodate that political faction, although silver made only a small inroad into the U.S. monetary system.

Beyond the regional opposition to a pure gold standard, wide swaths of American society shared a skepticism around banking, being generally opposed to delegating too much authority to a central bank that could manage and allocate a centralized supply of reserves. Instead, Americans chose the version of capitalism that retained both the potential for gains and losses to accrue to private agents who supplied expensive liquidity in times of extreme demand for it. That meant the US financial reserve of gold and silver that could be used to resolve liquidity crises was split into two pools: the US Treasury and the fragmented unit banking system. No formal mechanism existed to coordinate the responses of the managers of the two reserve pools during a crisis.

After 1840, the US Treasury's specie balances were maintained outside the banks, giving rise to the "Independent Treasury". Nonetheless, Treasury Secretaries felt obliged to deposit gold from its own vault system into banks when credit conditions were disturbed, in part because, as Treasury Secretary James Guthrie put it in 1853, a Treasury so configured might

¹ Senators from eight out of 45 total states were among the silverite coalition in 1895: Idaho, Nevada, Colorado, Utah, Montana, Oregon, South Dakota and Minnesota. Young, Bradley J. "Silver, discontent, and conspiracy: The ideology of the Western Republican revolt of 1890-1901." *Pacific Historical Review* 64.2 (1995): 243-65

itself cause a stringency anytime taxes collected exceeded expenditures (Dewey, 1922). Indeed, the Treasury could only effectively come to the aid of the financial system when it ran a surplus. history of US Treasury surpluses and deficits.)

Scholars at the turn of the twentieth century such as Kinley (1893) and Sprague (1910) wrote about the effectiveness and mechanics of such Treasury operations. Once gold was thus put into circulation, bankers had an easier time making loans to businesses. The Treasury could withdraw its deposits and move its gold back into its own vault system once business conditions settled down. Kinley (1893, p. 162) went so far as to write: “When a monetary crisis becomes acute, the business community is *accustomed* to look to the Treasury for relief, and on several occasions, this relief has been obtained. When credit has been strained to its utmost, the surplus of the government has been poured through the doors of the Sub-Treasury and has saved business from a collapse.”

The banking system had developed its own method of organizing scarce specie during financial crises using two chief tools: first, pooling the total reserves of a Clearing House Association, primarily that of New York City, and second, issuing Clearing House loan certificates backed jointly by all members upon satisfactory collateral from liquidity constrained banks (Moen and Tallman, *Journal of Financial Stability*, 20xx)

No apparent coordination is discernible between the leaders of the Treasury efforts and the leaders of the Clearing House efforts: the Treasury’s share of help ranged from 0% to 77% of total aid dollars over five crises while the NY Clearing House’s share ranged from 23% to 77% of total aid dollars. (See Table A for a history of how the two pools, the Treasury and the New

York Clearing House network, acted during Morgan's time to activate idle reserves during financial crises.)

In addition to the two primary pools of specie in the U.S., individuals, corporations, and commercial banks would also stockpile gold. Individuals may have hoarded it in anticipation of bank suspensions, companies used it to pay bills and private bankers stored it to pay coupons on bonds they had sponsored, an especially valued service by European investors. What the country lacked, of course, was a formal lender of last resort to bridge the pools of liquidity when financial crises arose. J.P. Morgan stepped in to fill this void.

He emerged as the private banker most adept at resolving market failures for liquidity and bridging disparate pools of reserves because over the course of his life he learned to assemble, motivate, and manage groups of domestic and international bankers, financiers and politicians. His deep knowledge of how to work with diffuse private interests allowed him to accomplish the tasks that the U.S. had been unwilling to authorize via legislation---organizing and allocating a supply of reserves in the absence of a central bank when panic arose and the payments system collapsed.

Through his creation of lender of last resort facilities in New York, Morgan maintained a national public good, the payments system, but he was then criticized by the public and by Congress for earning profits in the process. Had the legislature authorized a central bank, as had those of France and Britain, American legislators would not have been prompted to convene so many congressional investigations into how Morgan structured the lender of last

resort facilities. How he had profited from crises was always in the back of the mind of Congress

1895 JPM Gold Syndicate for the Grover Cleveland Administration: Part I

Morgan's 1895 gold syndicate established his reputation as the pre-eminent US banker who could coordinate global gold flows when he stepped in to stem the run on the Treasury's gold reserve.² For the first time he acted as the de facto governor of an implicit central bank of the U.S by bridging the two primary sources of the country's banking reserves: the Treasury and the banking system. By collaborating with European gold sources and by using his expertise at estimating risk and reward more accurately than President Cleveland or Treasury Secretary Carlisle Morgan would produce a successful result for the US Treasury and for his business.

How did he get so skilled at resolving systemic crises? One obvious way was to cut his teeth on resolving individual liquidity crises for his railroad customers. While the debt contracts were challenging to rewrite, the real skill came in negotiating terms that were acceptable both the railroad borrowers in the US and to the investors, especially those in London. In letters to his father, for example, Pierpont writes of endless wrangling to solve a liquidity crisis at the relatively small Cairo Vincennes railroad as far back as 1873 when he was only 36 years old.³ He and his father gradually built a network of railroad experts to resolve rolling stock and shipping connection issues that would eventually provide ailing railroad managers the wherewithal to

² Satterlee (1939), p. 277; Allen (1948), p. 106; Hoyt (1966), p.231; Carosso (1987), p. 351; Chernow (1990), p. 71.

³ Outgoing letters JPM to JSM, 1872-1889, The Morgan Library and Museum, NY NY

generate cash to meet interest payments and the collateral that would satisfy European investors that their principal would be returned in case of default. As early as 1869, Morgan was dealing with the largest acceptance houses in London regarding iron rail shipments for US railroads. These included Bischoffsheim, Raphael, Speyer, Ladenburg and Seligman, each of whom would eventually figure prominently in the 1895 transaction.⁴ After his father died in 1890, Morgan's communications with the London branch took the form of telegrams, replete with details about the negotiations to reorganize the Erie Railroad, the Reading, and the Northern Pacific in the period immediately preceding the 1895 transaction.⁵ Along with his negotiating skills honed with European counterparties to railroad financing, Morgan's extensive contacts in both the Treasury and in the Clearing House banks supported the process of forming his first systemic lender of last resort facility.

Next, the less obvious way he built his skills was by absorbing the experiences of his father, Junius Morgan, and of his father's senior business partner, George Peabody. The Peabody/Morgan partnership provided 40 years of institutional memory and learning, from the date his father joined the partnership in 1854 to the start of 1895, from which Pierpont could draw as the Treasury's crisis began to unfold. Foreign exchange crises were nothing new to Europe by 1895. Sudden, sharp disturbances to gold reserves at the Bank of England or to either gold or silver reserves at the Banque de France characterize a foreign exchange crisis. George Peabody himself would have gained experience with them since the founding of his firm, Peabody Riggs & Co., in London in 1837 almost twenty years before Junius joined him.

⁴ J. S. Morgan Joint Iron Account, #3, 1868, Morgan Grenfell archives, London Metropolitan Archives

⁵ J. S. Morgan & Co. Private Telegrams #8, Morgan Grenfell archives, London Metropolitan Archives

Peabody lived through his first run on London gold in 1839 when, with reserves plummeting, the Bank of England bought French gold with a loan from Barings, who in turn borrowed from twelve Paris banks (Flandreau, 2004, p. 115). The device, though rudimentary, was not unlike the ~~one~~ loan structure Morgan would use later in 1895 to secure gold for the US Treasury. The Banque de France, too, had been known to swap bonds or commercial paper for bullion purchases to replenish reserves, be it silver in the late 1830s and 1840s or later gold in the mid-1850s, (Flandreau, 2004, p. 115-116).⁶ Peabody would likely have transferred his foreign exchange knowledge and experience to Junius Morgan over the decade Junius worked with him, 1854-1864.

In the Panic of 1857, Junius was actively working with Peabody in London and Pierpont, at age 20, was employed at Duncan Sherman, Peabody's correspondent in New York. When Duncan Sherman could not collect the monies owed to it, Peabody in turn could not make good on its obligations in London. Indeed, Duncan Sherman's receivables ballooned by about £1 million, increasing its payables to Peabody from £2.8 million to £3.4 million.⁷ Peabody sought an £800 thousand line of credit from the Bank of England to avoid collapse, not much larger than the size of the Duncan Sherman problem. The Bank granted it at the prevailing risk-free discount rate as long as a private loan loss syndicate was formed to absorb any losses.⁸ (Carosso, 1987) Afterwards, Peabody and Junius discussed the lessons learned from that

⁶ In the early 1800s, neither the Bank of England nor the Banque de France relied heavily upon changing their discount rates to influence gold flows (Flandreau, 2004, p. 116).

⁷ G. F. Peabody and J. S. Morgan General Ledger, 1855-1857, Morgan Grenfell archives

⁸ The syndicate was made up of thirteen British financial institutions because the collateral that Peabody wanted to pledge, American railroad bonds, was not acceptable to the Bank of England: only British collateral was acceptable.

experience and agreed to change their business practices to include more careful scrutiny of the businesses to whom they lent funds. The close 35-year working relationship between father and son, Junius and Pierpont, from 1854 when Pierpont started at Duncan Sherman, to Junius' death in 1890, was the conduit of Peabody's experience down to Pierpont (Carosso, 1987, p. 44-104).

After Peabody died and Junius had become lead partner of the London bank, Junius organized the crisis 1870 loan of £10 million to the French Treasury that enabled France to fight the Prussian War. The Rothschild brothers deemed the loan too risky and declined the opportunity to make it (Ferguson, 2000), leaving an opening for Junius Morgan to take the risk. Junius offered the 6% coupon bond at 85 to yield $7\frac{3}{8}\%$, a yield so high as to indicate high risk, but not as high as French delegates had expected it would take to attract investors, $8\frac{3}{4}\%$ to 9%.⁹ Even though France lost the war, its government honored the terms of the loan contract. With a syndicate comprised of primarily French aristocrats and bankers, and few English members,¹⁰ the £1 million profits Junius earned were by far the most made in his entire career in one year. This taught him that sometimes taking an enormous risk after scrutinizing the borrower's history could lead to huge gains, a lesson likely not lost on Pierpont. (See Figure A for profits.)

The third way Morgan learned how to organize and price a lender of last resort loan was by selecting subject matter experts unique to each crisis in the same way he did for railroad reorganizations. Experts could reduce information asymmetries and add knowledge about

⁹ Carosso, p. 131.

¹⁰ J. S. Morgan General Ledgers, 1868-1870 and 1870-1871, Morgan Grenfell archives

niche financial markets. They could reduce adverse selection before a transaction and moral hazard after a transaction. In short, they could help Morgan negotiate the equilibrium price for a transaction by helping to identify and control the risk.

We find a pattern of how Morgan used subject matter experts in the years leading up to 1895 by examining his Syndicate Books. We find that by grouping the members of Morgan's securities underwriting syndicates into two groups, those that participated frequently and those that participate infrequently, we can see different characteristics emerge between the two groups.¹¹ The members that participated frequently seem to have been bankers with substantial liquidity available, or capacity, to make loans to many kinds of borrowers. The members that participated infrequently did not seem to have consistent capacities to lend, nor did they have significant commercial lending expertise, but they did have substantial niche expertise that filled information gaps between the borrower and the lenders. For example, J. Lowber Walsh a member of a prominent Philadelphia banking family, appeared frequently in many types of underwritings contributing large dollar amounts. Thomas Alva Edison, in contrast, appeared only once in the Edison Electric common stock underwriting in 1882 for which he would have been a perfect subject matter expert. In 1895, the information problem to be solved was one of foreign exchange and gold shipments. Therefore, the relevant subject matter experts were the gold shippers. And, consistent with our findings of typical Morgan underwritings, we find the infrequently appearing gold shippers of Lazard, Ickleheimer

¹¹ We base this approach on the econometric analysis of Hauteceur, Riva and White, 2014.

Heidelberg, Ladenburg Thalman and von Hoffmann were included as syndicate participants in the 1895 gold coin loan.

A. Banque de France Loan to Comptoir d'Escompte

We turn to two experience that immediately preceded 1895 that would have produced valuable lessons for Morgan. His 1895 Gold syndicate was the third in a sequence of pre-emptive central bank facilities to avert banking and forex crises in the late 19th century. The first two were central bank facilities by France and England to forestall banking crises that could have developed into full-blown foreign exchange crises, and the third one was a private American facility to forestall a foreign exchange that could have developed into an international banking crisis. What JPM learned during the first two became apparent when he applied skills and techniques learned from each of those in constructing and managing the third facility, the 1895 US Gold Loan.

The first of the early-1890s pre-emptive facilities was arranged by the Banque de France in 1889. Once the Banque arranged ample gold to shore up its own stores of liquidity with help from the Rothschild family bankers, it organized a loan for the distressed Comptoir d'Escompte (Bank of Discounts, a commercial bank). The Comptoir had borrowed funds from many French banks to corner the copper market. The copper price bubble burst, the corner attempt failed, and the Comptoir was not going to be able to make good on all its borrowings spent buying copper that it had taken from other banks. A widespread run on French banks was in the offing. (see Hauteceur, Riva, White, 2014 for a detailed explanation of the episode.)

The Banque de France faced a dilemma. It could only loan at its official discount rate, generally about 3%. The rate was low because the discounted collateral was narrowly defined to ensure high quality, making its loans almost risk-free. The situation in 1889, however, was fraught with risk. The Comptoir's collateral was suspect at best and likely not enough to ensure the Banque would recoup its emergency funding. To create a risk-free loan that would be fairly priced at only 3% in the market, the Banque devised a way to offload the risk—it created a loan loss syndicate. It lent to the Comptoir on the condition that a private syndicate of the banks that had enabled the Comptoir to speculate so heavily on copper, agree to absorb the first 20,000,000 Ff in losses (£800,000) if the Comptoir could not pay back the Banque. (See Appendix A for a supply demand figure that explains the shortage of funds available in a crisis when a central bank is only willing to loan at a low discount rate.)

The Morgans had connections with the Banque de France's loan loss syndicate members. Indeed, at the time, JPM & Co. was a syndicate partner on unrelated corporate and sovereign debt with Société General, one of the largest banks involved in the loan loss syndicate. (Syndicate Books, DM 1). JSM & Co. had also been regularly involved with the Rothschilds on several sovereign debt underwritings (Syndicate Books, DM1 and DM2), and the Rothschilds were integral to securing the ample gold supply the Banque de France arranged prior to dealing with Comptoir.

The facility for the Comptoir was successful and none of the loan-loss syndicate members were called upon to reimburse the Banque de France, but the principals of the Comptoir lost their personal fortunes, a feature of the contract imposed to thwart moral hazard

actions by other similarly minded, risk-taking French banks in the future (Hautecoeur, et al, 2014).

B. Bank of England Loan to Barings

In the second of these facilities occurring the very next year in 1890, the Bank of England created a loan facility for Barings Brothers in anticipation that Barings would not be able to honor the short-term debt it borrowed from London banks that funded Barings' exposure to its large position in Argentinian securities. Like the Banque de France did a year earlier, the Bank of England shored up its own store of gold before agreeing to lend to Barings. The Bank of England also insisted on a loan-loss guarantee fund made up of the London banks thought to be enablers of Barings over-extensions. Like the Banque de France, the Bank of England was loaning to the distressed firm at a risk-free rate implying it, too, required a lender of last resort strategy to off-load the risk. Again, the Rothschilds were prominent in the effort to secure adequate gold by the central bank before it embarked on saving a private bank.¹² Again, the central bank strategy was to pre-emptively act to avoid a banking crisis that could result from the failure of a key intermediary. (Flores, 2011; White, 2016)

In this facility, the House of Morgan was not just an interested by-stander as it had been in the 1889 Banque de France loan; it was included in the loan-loss guarantee syndicate (Syndicate Books, DM2). JSM in London had acted as co-syndicate manager for at least two Argentine bonds in conjunction with Barings and C. J. Hambro, another private bank whose

¹² The Morgans had dealt with the Rothschilds going back to at least 1870. J. S. Morgan & Co. underwrote the French war loan of 1870 to jump from a 'minor American firm' to a highly regarded international banker' only after the Rothschilds passed on the opportunity, thinking the risks were too high. (Ferguson, 1998, p.711.)

namesake leader was also a director of the Bank of England (Syndicate Books, DM 1 and White, 2016). JPM was responsible to pay up to £500,000 to the Bank of England in case the auction proceeds of Barings' assets were inadequate to pay back the Bank for its bailout. JPM would have witnessed the eventual auction of the Barings' country homes, town homes and other personal effects as it sought to pay bank the Bank of England. (White, 2016)

Morgan's 1895 facility was similar to the Baring's facility in at least one important aspect: in order to shore up the gold store of the Bank, it extracted a promise from Russia to leave on deposit at the Bank of England the gold Russia agreed to supply to the Bank (White, 2016). Russia may have agreed to such a promise because of the value of making and keeping a promise to another sovereign state. This aspect of the contract would figure prominently in the third pre-emptive loan facility to come in the US. As with the Banque de France 1889 facility, the 1890 Baring's loan loss guarantee syndicate members were never called upon to reimburse the Bank of England, although it took until 1895, a full five years, for Barings to pay back its borrowings from the Bank (Syndicate Books, DM1).

1895 JPM Gold Syndicate for the Grover Cleveland Administration: Part II

Following the burst of the copper bubble in 1889 and the 1890 collapse of Argentinian state bonds in the Barings crisis, the general shift to global deflation continued in the early 1890's. This caused financial distress among American railroads, resulting in a wave of banking panics across the U.S. in 1893. To avoid defaults Morgan became heavily involved in restructuring the debt obligations of US railroads, especially the ones primarily funded by

Europeans. At the same time the political clamor for silver to back currency along with gold was gaining strength in the West and the South. Agricultural interests believed they were suffering from the slow deflation brought about by a money supply constrained by an inelastic supply of gold. As the decade wore on, European holders of American debt estimated the risks of not being paid in gold were rising because the cash flows from railroad bonds were drying up and agitation to fully monetize silver were increasing. Gradually they sold American securities and shipped the proceeds back to Europe in gold (Simon, 1968). See Appendix B for a more detailed explanation of how international gold arbitrage worked during the pre-war gold standard.

Since the end of the Civil War the US Treasury had attempted to keep a reserve of \$100 million in coin and specie as a reserve against greenbacks and then its note issue more generally. The steady drain on the Treasury's gold reserve in the 1890s turned into a run by 1894 and 1895, alarming President Cleveland, Secretary Carlisle, and JP Morgan. As the reserve declined towards \$100 million and then continued to fall well below, efforts to replenish it intensified.

But why was \$100 million viewed as a critical threshold by contemporaries and current researchers? Some, like Elmus Wicker (2000) and President Cleveland himself (SEP, May 7, 1904) say it was purely a customary threshold. Others say it had been set by statute (Simon, Carlisle). Others contend that it had its origins in statute, but that was only because various other restrictions on the Treasury had brought it to the forefront (Dewey Davis). Treasury Secretaries Sherman and Folger used the \$100m figure as a rule of thumb for holding reserves against Treasury notes and legal tenders. After further investigation, we argue that there was

no explicit requirement for the Treasury to hold \$100 million in gold coin or bullion. But the figure gained legitimacy in several federal statutes.

The figure is first found in chapter 290 of *The Statutes at Large of the United States of America from December 1881, to March 1893*. Chapter 290 is mainly “An act to enable national-banking associations to extend their corporate existence, and for other purposes” (p. 162). The first eleven sections set out how national banks can extend their charters for another twenty years or liquidate their operations, along with some explication of the procedures for receiving various bonds of the US. Section twelve sets out the reason for the \$100 million reserve as one of the “other purposes” of the act. It authorizes and directs the Treasury to receive deposits of gold coin in sums not less than twenty dollars and to issue certificates in the same amounts. These certificates will be receivable for customs, taxes, and all public dues and will also count as part of a national bank’s lawful reserve. It also stipulates that no national bank can be a member of a clearinghouse association that does not accept these certificates as part of the settlement of clearinghouse balances. Silver certificates are also included for all these purposes.

The Secretary of the Treasury, however, “shall suspend the issue of such gold certificates whenever the amount of gold coin and gold bullion in the Treasury reserved for the redemption of United States notes falls below one hundred millions of dollars; and the provisions of section fifty two hundred and seven of the Revised Statutes shall be applicable to the certificates herein authorized and directed to be issued” (p. 165). (Section 13 elaborates on the prohibition of the over-certification of checks by national bank officers and agents (p. 166.)).

The figure appears again in the Morrison Surplus Resolution of July 31, 1886. There had been much debate over the disposition of the Treasury's surplus funds leading up to this resolution, some sides wanting the Treasury to have control of its surplus for prudential reasons, others wanting much of it returned to the public (Timberlake 1993, ch.11 provides an extended discussion of the debate). In the end, the resolution directed the Treasury to buy back interest-bearing government debt in monthly increments of \$10m when the surplus got above \$100m, with the Secretary allowed to maintain an additional \$20m if he deemed conditions warranted so. The President could suspend this buy back provision if he also deemed such a suspension prudent.

Therefore, it was legal for the Treasury to go below \$100 million in reserves, but the prohibition on issuing further notes made it undesirable to do so, and the directive to buy back government debt and set the figure clearly in Treasury officials' minds. This reserve figure is unlike national banks and their required legal reserve requirements, which were mandated by the National Banking Acts of 1863 and 1864.

By 1894 it was clear that the persistent gold outflows would put the Treasury in a precarious position, unable to redeem its notes or legal tenders with any confidence. To put the US specie reserve in perspective, its size at the US Treasury dropped from \$321,304,106.00 to \$189,162,022 from 1890 to 1893. Its composition changed, too. (See Figure C.) In 1890 it was 49.8% gold, 50.2% silver but by 1895 it was 28.2% gold and 71.8% silver, making it difficult to believe it could continue to maintain a constant exchange rate between gold and silver.¹³

¹³ US Treasury Report 1888 to 1893 from Census.gov

Perhaps less well documented, the specie on deposit at the Clearing House Banks was \$195,900,000 in 1890 and \$224,700,000 in 1895, making the Clearing House Banks the de facto, if not de jure, repository of the US specie reserve in the absence of a central bank (See Figure D).¹⁴

The primary US government officials in the attempts to restore the US Treasury's gold reserve were President Grover Cleveland, Secretary of the Treasury John G. Carlisle, Assistant Treasury Secretary William E. Curtis and Attorney General Richard Olney. All were lawyers by trade, not bankers, so none were skilled at designing financial contracts, let alone a contract that could stop the run on the Treasury's gold. They were more concerned about and dedicated to overcoming the political opposition within their own Democratic party posed by the growing silver caucus. Morgan had personal and professional connections to two of the four: Grover Cleveland and Richard Olney.

Cleveland started his political career as Mayor of Buffalo and then was elected Governor of New York. Among the partners in Cleveland's New York law firm of Bangs, Tracy, Stetson and MacVeigh was Francis Lynde Stetson, Morgan's primary corporate lawyer.¹⁵ With such a close connection to Grover Cleveland's law firm, it is no wonder that Morgan supported Cleveland's presidential campaigns; Cleveland was the only Democrat Morgan ever voted for. Winning the presidency for the first time in 1884, Cleveland lost in 1888 despite winning the popular vote, but was re-elected in 1892, the only president to serve two non-consecutive terms. John G. Carlisle, too, was a lawyer who had served as Speaker of the House of

¹⁴ Comptroller of the Currency reports, 1882-1893, Table #17, <https://www2.census.gov/prod2/statcomp/documents/1893-02.pdf> Retrieved June 16, 2022

¹⁵ Carosso, p. 366.

Representatives since 1884 hailing from Kentucky. Olney graduated from Harvard Law in 1859, had served in the Massachusetts House of Representatives, and was a friend of Robert Bacon, Morgan's new junior partner. As Attorney General, Olney was in charge of making sure any transaction was legal, that is, whether Congress had ever delegated authority to the Executive branch to form a loan contract in an emergency, circumventing the rule that Congress must approve each debt the Treasury incurred.¹⁶

President Cleveland made two futile attempts to restore the gold reserve in 1894. The first one was a January public bond subscription for \$50,000,000 that would have only raised \$8,000,000 if not on the last day the New York Banks took up the balance. With a coupon of 6% priced at \$117.22, the bonds yielded only 2.98% to maturity indicating investors perceived little risk to the transaction. The US Treasury used the proceeds to buy gold, but the subscribers turned around and redeemed their bank notes for new gold from the Treasury's reserve. As a result of continued redemption of bank notes for gold, the Treasury only was able to augment its gold reserve by a few million dollars. Without any commitment to refrain from shipping gold to Europe, there was very little risk for participants in the transaction—they could take advantage of exchange rates when opportunities arose after the bonds settled and ship gold to Europe in open market trades. With no restraints on withdrawing and shipping gold abroad, there was little risk for investors, and it made sense that the transaction was priced to yield a modest return. Indeed, Morgan recorded a profit of about 4%, or \$200,000 an investment of

¹⁶ Congress had to approve each individual debt the Treasury incurred until WWI. During that War so much borrowing took place that Congress approved a blanket authorization for any debt up to a certain limit. We live today in that resulting environment when increases to the debt limit are what Congress must approve, not each individual loan the Treasury borrows.

\$5,000,000 principal, after finding buyers in London.¹⁷ And without a clear shift away from the risk of bimetallism and without an improvement in railroads' profitability, it should be no surprise that the European gold withdrawals resumed.

The second attempt by Cleveland's Treasury Secretary in November of 1894 to borrow money to buy gold through a bond issue fared only slightly better than the first. It was necessary because the Treasury's gold balance had dipped to below \$60,000,000 again. This time, the Treasury sold the whole \$50,000,000 to a syndicate headed by JPMorgan composed of NY Clearing House banks and two gold ~~dealers~~ shippers, Lazard Freres and Heidelbach Ickelheimer. Similar to the first bond in January, this one was issued with a 5% coupon, ten years to maturity and priced at 117.07 to yield 3% even. Most of the gold reserves in private hands in the US resided either with the NY Clearing House members or with the gold (foreign exchange) ~~dealers~~ shippers, so it is no surprise that Morgan invited them to form the second syndicate.¹⁸ While the offering produced the \$50,000,000 that the Treasury used to buy gold, there was still no mechanism to prevent the gold from subsequently being withdrawn from the Treasury or to stop it from being shipped to London. Without risk of missing foreign exchange trading opportunities, this transaction again was low risk and priced to yield a low return. However, following a dissatisfactory first attempt, perhaps risk of exiting gold increased in agents' minds; the second attempt underpriced risk and led to a loss, albeit a modest one, for

¹⁷ Carosso, p. 747, FNs 27 and 28.

¹⁸ See Commercial and Financial Chronicle, Vol 63, p. 532 dated September 26, 1896, for a list of prominent gold shippers, most of which were included in Morgan's 1895 Gold syndicate, but not in the 1894 Treasury subscriptions.

syndicate participants. A loss of £673 on £1,000,000 is recorded on the Morgan's London firm's share.¹⁹

The administration's two attempts at replenishing the Treasury's gold reserve through public bond offerings failed as the Treasury's gold balance declined to \$40 million by February 1895. Cleveland now had to take drastic action: he would ask private bankers to buy gold and figure out a way to keep it in the Treasury. The first banker Carlisle approached was August Belmont, Jr., not Morgan. Belmont's father, a prominent Democrat, had been credited by the Democratic party's leadership as being a crucially important fundraiser in 1884, leading to Cleveland's first election to the presidency. August Belmont Jr. had campaigned for Cleveland in 1892. With a rough outline of a loan suggested by Carlisle, Belmont immediately contacted Nathaniel Rothschild, the London based brother of the famous pan-European banking family and the principal for whom Belmont acted as American agent. Rothschild felt the loan could be done with somewhat altered terms, and immediately contacted Walter Burns, the lead partner of the Morgan London branch. It was left to Burns to contact Morgan himself, and only after Rothschild had a general plan in mind.

It would be a clash of titans. "Bluffing, stalling, and screwing" were how his peers described 1st Baron Nathaniel Mayer Rothschild's negotiation tactics, with "vengeance, contempt and skepticism" thrown in, making them "squirm at the thought of dealing with him." (Ferguson, 2000) Morgan's peers did not describe Morgan much differently. He "struck terror into many hearts," with the "driving power of a locomotive...with eyes piercing as the

¹⁹ Carosso, p. 318.

headlights of an express train.” Others said he had “as powerful a personality as the US had ever produced” a man who “knows what he wants and gets it.” (Carosso, p. 433) But Morgan’s peers noted a somewhat different core compared to Rothschild. Bishop William Lawrence of Massachusetts noted “he tries to conceal an unconquerable bashfulness and tenderness of heart.” (Carosso, p. 433) Morgan and Rothschild were not completely different in background. Nathan Rothschild, or Natty, was three years younger than Pierpont, and like Pierpont, had inherited the leadership of an investment banking firm upon his father’s death. Both men expected their sons, in turn, to inherit the family banking business upon their own deaths, both taking a dynastic view of their businesses. Both men had earned their reputations by underwriting successful issues of government debt starting in the 1860s.

Here the similarities end. Because Rothschild was only 39 when his father died in 1879, his leadership was already thoroughly established by 1895. Pierpont’s father died in 1890 when Pierpont was 53, leaving Morgan running his firm for a scant five years when the 1895 crisis developed. Next, the Morgan partnership network was a spring sapling compared to the Rothschilds’ mighty oak. Natty in London could count on banker cousins in Paris, Vienna, Naples and Frankfurt and agents in New York and Sao Paolo for inside information about the state of global money market. Pierpont had partners in just London, Paris, and Philadelphia. And more importantly, Pierpont controlled nowhere near the size of family financial reserves as the Rothschilds controlled. While Natty had close family ties to rely on, Morgan had to consider the views of more unrelated and independent people when negotiating. Morgan would have to convince many more acquaintances to join him in raising money for the American half of the syndicate, any of whom could refuse. Rothschild, on the other hand, could count on his cousins’

firms once he had convinced them about the initial terms of the deal. This could give him an advantage in negotiations: he could respond more quickly during the heat of the battle with Cleveland and Carlisle because he could rely on his cousins.

Finally, the stakes were much higher for Morgan than they were for the Rothschilds. The outcome of the negotiations with Cleveland would have a much bigger effect on Morgan's business than it would have on the Rothschilds' businesses. Without the US firmly on the gold standard, promises of paying interest on debt to Europeans would ring hollow and they would no longer buy subscribe to Morgan's American bonds. For the Rothschilds, relatively little of their business depended on American bonds. So why would Rothschild be motivated to help the US stay on gold, to support Morgan's efforts? One cannot underestimate how much profit the Rothschilds made on their vertically integrated gold operation (Blagg, 2013). Owning gold mines, smelting facilities, refinery facilities, shipping lines and trading positions all likely motivated Rothschild to want the US to stay on the gold standard.

How had Rothschild behaved during lender of last resort negotiations during the most recent financial crisis? If we can find clues in how he handled the Barings' request for aid in 1890, we might understand his approach in the 1895 American negotiation. The scale of the Barings disaster remained hidden until the eleventh hour. Everard Hambro, an investment banker who also served as a director of the Bank of England, approached Natty on November 8, 1890, for his opinion on whether Barings could be saved. Rothschild's answer was to let them go, revealing that Rothschild's first instinct was to serve his self-interest by letting a competitor fail. By November 11, however, Rothschild relented, realizing the scope of the situation and determining the risk that a Baring default would be too big for the London market, and hence

his London business, to handle. What prompted the reevaluation of risk? Holders of Barings notes swamped the Bank of England, requesting sales to the Bank at a discount. The Governor of the Bank of England, William Lidderdale, convinced Natty to provide a £2 million loan to shore up the Bank's reserves, which he does by cabling his cousin, Alphonse, in Paris. Alphonse held significant gold, and gold was what the Bank of England needed, so much so, that the next day, Lidderdale requested another million and got it from Natty, who got it from Alphonse. By Friday the 14th so many more bills were being presented to the Bank that the Prime Minister, Lord Salisbury, agreed to step in to help the Bank by promising to absorb up to half the losses on any Barings paper so discounted, but only for the next 24 hours. After that, the Bank would be on its own, meaning the Bank faced a wind sprint to raise a pool of funds to absorb Barings losses.

What did Natty do as Lidderdale began asking for commitments from London bankers for a loan loss reserve? He hesitated. He claimed he needed to check with his cousins first. Responding to Natty's delay tactic with, "Well, we don't need you," it was clear that Lidderdale had had enough of Rothschild's delays. Rothschild now faced the prospect of being relegated to the B-list on the sidelines of the deal. He recalculated and agreed to join the syndicate, perhaps so that he could shepherd Alphonse's £3 million exposure and perhaps also so that he could continue to influence how his nemesis, the Barings, would be bailed out.

Morgan would face similar tactics from Rothschild as the clouds gathered in Washington and New York a short four years later in 1895. Morgan faced two main tasks: first, to get the US Treasury Secretary Carlisle and President Grover Cleveland to acquiesce with Rothschild's terms in order to get the gold the US Treasury needed and, second, to convince influential financiers

in the US to subscribe to a syndicate to issue U.S. government bonds priced to reflect the risk perception spreading in the markets that the US might adopt a de facto bimetal currency regime. After all, if the Treasury's gold outflows could not be stopped, the US would have no choice but to redeem its notes in silver instead of gold. The US had a fixed ratio of 16 oz. of silver to 1 oz. gold, but with a surfeit of silver, and with almost all US trading partners on the gold standard, global trade and financing could come to a halt with silver overvalued. Without a lender of last resort in the U.S. to backstop losses if the scheme failed, bond prices and in turn yields had to reflect market risks while providing an appealing profit to private participants in the syndicate.

From his experience with Russia's promise to maintain the gold it sold to the Bank of England on deposit at the Bank of England, Morgan knew that lessons could be learned from gold shippers and gold owners about how to motivate their behavior. In the U. S. the absence of a central bank might have made it less likely a sovereign like Russia would voluntarily maintain a gold reserve in the US. With Rothschild calling the shots from London because of his influence at the Bank of England and his cousin's influence at the Banque de France, the deal had a chance of reversing the flow of gold into the US instead of out of it. Perhaps US gold shippers Lazard and Heidelbach shed light on how the terms of the facility could be improved to suit the conditions in the US financial markets. In any case the terms of the successful third attempt to restore the US gold reserved hinged two changes compared to the unsuccessful first and second transactions: the inclusion of more gold shippers, more Clearing House banks, and many more Europeans in the syndicate as well as changes to the bond's terms that would motivate them to not hoard gold or ship gold abroad.

From January 24 to February 7, Treasury Secretary Carlisle and Morgan argued about whether the bonds that would be issued to buy 3.5 million ounces of gold for \$62.5 million would price at 3 ½ % or 3 ¾%, Carlisle insisting on 3 ½% with Rothschild insisting on 3 ¾%. Morgan thought the parties would settle in between at 3 5/8 %, but Rothschild won the day, and the 4% bonds were issued at 104.5 to yield 3¾%. His victory on pricing implied the Americans needed Rothschild more than he needed them. Note these yields were much higher than either the 1889 French deal or the 1890 British deal were, and they were higher than the first two unsuccessful American attempts. Because the US lacked a central bank that could make risk-free loans by removing the risk from the deal, the American transaction had to price in the significant risk of failure from the very start of negotiations. (See Appendix C for a comparison of the comparative risks in 1895 versus 1889 and 1890 transactions organized by central banks.)

The bonds were oversubscribed and sold out within two hours in London. The syndicate members were then able to sell the bonds to the public at 112 1/2 (Morgan selected the price, it was not an auction price) the week after and over 120 about a month later, bringing an annualized 12% profit to syndicate members, much higher than the 1% gain or 1% loss on the first and second transaction.²⁰ We interpret the rally in the price to reflect dramatically reduced uncertainty about whether the US was truly committed to remaining on the gold standard. By creating a deep international syndicate, market participants might have decided that the US it was truly committed to the gold standard. In this third attempt to replenish the

²⁰ See Syndicate Books, J. P. Morgan & Co. Vol 1, p. 24 for profit details on the 1895 transaction.

Treasury's gold reserve, Morgan and the Rothschild had priced the transaction right from their perspective: they recognized the risk participants would take to lock-up funds for six months, avoiding possible gains from foreign exchange transactions and creating exposure to losses from the same. The profit from the sale of the bonds was the reward for the risk taken to keep the gold in the US.

Normally a US bond was considered almost risk free and was issued by the US Treasury with a promise to pay 3% interest annually. With the run on the gold reserve, the US was no longer considered a risk-free bond issuer. Morgan and the Rothschilds recommended a 4% coupon rate to compensate investors for the risk the US could renege on its promise to pay interest in gold. They priced the bond at 104¢ on the dollar so that netting the one-time 4¢ premium against 30 years of 4% annual interest payments, the ultimate yield earned by the bondholder would be 3.75%.

What happened next was exactly what the bankers had hoped for: investors' perception of the risk of the US going off gold receded sharply, and the bond was offered to the public at 112¢ in the after-market, a huge gain to the bankers, who had originally bought the bonds from the US Treasury at 104¢. A few days later, the bonds traded even higher at 120¢. At 120¢, the bonds yielded 3%, the risk-free rate. The roster of so many heavyweight European and American bankers committed to fixing Cleveland's gold reserve problem demonstrated just how resolved the US and its European trading partner were to keep the US on the gold standard. (See Appendix D for a review of bond risks, prices, yields and profits.)

The first key to keeping the gold stateside was that the profit of 800 basis points on the bonds might have been enough to offset the loss of normal profits on monthly gold shipments that were regularly earned by the gold dealers in the syndicate (Winkler, p. 155; Friedman and Schwartz, p. 111). The regular spread on gold earned by Lazard or Heidelberg was only about 1/8% or 3/8% on a shipment of gold (Simon, 1968). If Lazard could earn as much on the profit of the bond in one week as it took them to normally earn shipping gold over six months, then Lazard could commit to the promise of not shipping the gold out to Europe. It was probably not a coincidence that the terms of the syndicate expired on September 30, six and a half months after the bond issue; that is the date around which seasonal gold inflows from Europe would start to arrive to pay for exported US crops. Indeed, Lazard finally asked to be released from its agreement to not ship gold to Europe on September 15, signaling perhaps that its satisfaction from living off bond profits was ending a just a little before the syndicate was due to expire.

The second key to keeping the gold stateside was to convince the NY Clearing House banks to sell their gold to the Treasury and not ship it abroad. Eleven NYCH banks participated in the 1895 syndicate. They had \$42,561,700 of specie as of Oct 27, 1894, out of a total \$93,916,000 held by all NYCH banks. (45% of total specie) Only 8 of the top ten banks participated in the syndicate: Chemical and Importers & Traders did not participate. The banks that ranked 17th, 19th and 25th in terms of specie did participate: Western National, Merchants' and Gallatin. This may indicate that capacity was not the only reason to participate in the syndicate. Other possible reasons for participation may have been social connections, director connections or banks' risk preferences.

National banks generally increased specie as compared to deposits over the period from 1890 to 1893, going from 10.8% to 15.3%. ²¹ Comparing the eleven participating New York Clearing House banks to the other Clearing House banks, we find that specie balances at the eleven banks grew faster after the 1894 syndicate leading up to the 1895 syndicate. This may mean that the eleven banks were accumulating specie in advance of the 1895 syndicate as well. Apparently, the Clearing House banks had begun to stockpile gold in anticipation of a foreign currency crisis with the US potentially going off the gold standard and resorting to silver (Simon, 1960; Simon, 1968, p. 390). The NY Clearing House stockpile could have been a strategy to prepare for a banking crisis in case the US abandoned the gold standard. The inclusion of the Europeans in the syndicate again likely was a convincing signal that support for the US was serious and the US commitment to gold was true, reducing the likelihood of abandonment of the gold standard. The profits the Clearing House banks earned on the sale of the Treasury bonds at 110 or 120 could have improved liquidity conditions among them. Indeed, the President of the Fourth National Bank in NY later wrote George Baker, President of the First National Bank, to thank him for making sure the Fourth was included in the profitable syndicate, acknowledging how the profits mattered to his bank in a year of lean profitability.²²

There was another brief but potentially disastrous run on the US gold reserve in the summer of 1896 (Simon 1960) as concern over William Jennings Bryan and silver resurfaced during the Democratic National Convention in Chicago. The Cleveland administration attempted another public auction of Treasury bonds to buy gold. But without the promises of

²¹ Comptroller of the Currency Reports, Table #17 Amount of Resources and Liabilities of the National Banks.

²² Letter at the George F. Baker archives, Baker Library, Harvard Business School

gold dealers and others to stop gold shipments to Europe, little was accomplished by the fourth Cleveland administration's attempt to shore up the gold reserve. Acknowledging inconvenience of doing the fourth transaction, George F. Baker, President of the First National Bank of New York later would write to his son that they should have done a bigger offering of the third issue: "\$100myn was not enough." Eventually gold discoveries in the Canadian Yukon, Australia, and the Witwatersrand along with technological advances in the gold smelting process increased the high-powered reserves over the rest of the decade for gold standard countries. Railroad profitability revived, reducing European fears of losses on railroad bonds. Republican William McKinley won the 1896 election, not William Jennings Bryan, the Democratic silverite candidate and the threat to the gold reserve in the States diminished markedly by the end of the 1890s.

Conclusion

As Gorton and Tallman (2018) point out, the New York Clearing House's organization structure was not built to be a repository of knowledge about how to resolve financial crises that occurred outside the Clearing House member banking network. We argue that the House of Morgan was the repository for institutional memory and institutional learning about how to resolve systemic financial crises in the US. Starting with George Peabody's experience in the Panic of 1857, followed by Junius Morgan's experiences in 1870, 1889 and 1890, Pierpont had accumulated the skills to deal with private and governmental interests simultaneously. He became well acquainted with the network of financiers in London and Europe through his original business in financing American railroads' purchases of iron rails from England. He

learned how to reorganize debt after a railroad could not make good on its borrowing promises. His business practices developed to include subject matter experts into normal securities underwriting practices, practices that would help reduce adverse selection before the borrower secured a loan and would help reduce moral hazard after the borrower secured the loan. Finally, he learned to price loans effectively by reducing risk and estimating acceptable returns in the absence of a backstop from a formal lender of last resort.

What did Pierpont learn from the Banque de France and the Bank of England as he emerged as the de facto central banker in the US? First and foremost, from both the French and British transactions he must have had no doubt that banking crisis and foreign exchange crises were entwined and that the resolution of one crisis depended on resolving the other. He saw how heading off a crisis before it completely overwhelmed a financial market was better than letting a full crisis develop.

Next, he would have learned specific techniques that the two central banks employed to get transactions to actually work. Negotiating how the risk would be mitigated and priced was better than doing a public auction when systemic failure was a possible outcome. Seeing how the Bank of England motivated a significant amount of Russian gold to remain voluntarily stockpiled in its vaults would have shown Morgan that it was possible to temporarily short-circuit international gold flows. And he would have seen how each central bank purposefully constructed contingent syndicates to include those agents with the deepest expertise in solving the problems at hand. The Banque de France included French bankers who had lent to the copper corner. The Bank of England included agents who had lent to the Barings. In the US setting, Morgan included agents who had the most to lose if the US went off the gold standard:

commercial banks, investment banks and gold shippers. He would have learned to always include or consult with the Rothschilds who perhaps knew the global gold and silver markets best.

Finally, while he succeeded in saving his firm and everyone else's along with it, he learned that he would be roundly criticized. Even though Cleveland was pleased with the final outcome, the terms of the contract would be investigated by Congress and bashed by the press. The 1895 transaction would have been Morgan's first experience at managing the public outcry and political second guessing when his roles blurred between being a private banker who used the profit incentive to structure deals and being a central banker who used the best interest of nation to guide him in deal making. (Congressional Record-Senate, 2/19/1895, p. 2384) Morgan was required to provide lengthy testimony to the US Senate for why the 1895 transaction had to yield between 6 and 15 percentage points profit to private syndicate members. While Morgan largely kept mum, we might answer the question today that basically, without a strong institution to act as LOLR during a crisis, profit motivations had to be used as a motivating force and coordinating mechanism. Morgan's abilities to assess risk and return and to survive the ordeal of dealing with the Rothschilds did not come cheaply.

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Figure A: Morgan & Co. Profits and Losses, 1857-1913, The Morgans Private International Bankers 1854-1913, Vincent Carosso, Harvard University Press, 1987

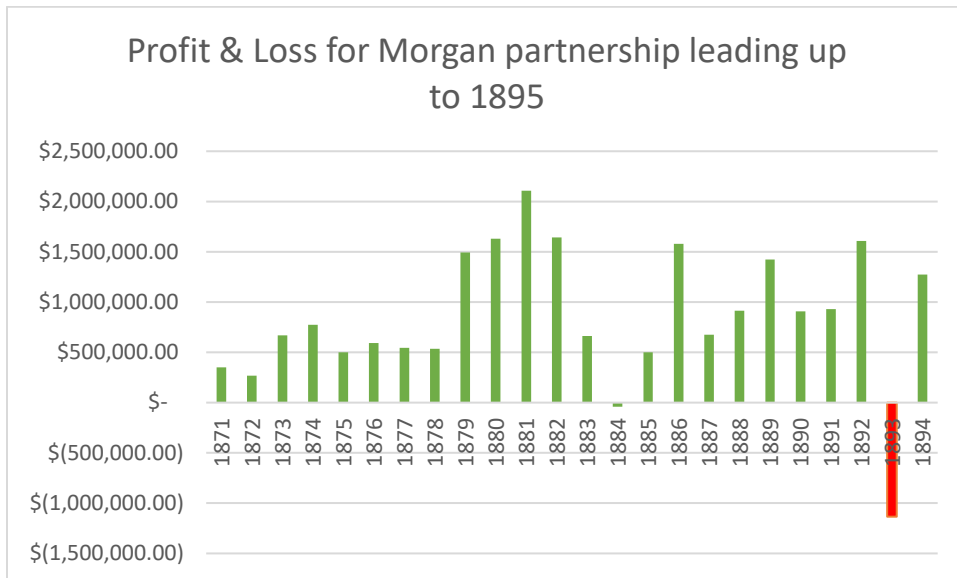


Figure B: US Treasury Surplus and Deficits 1791-1901, Davis R. Dewey, Financial History of the United States, Longmans Green & Co. New York 1903.

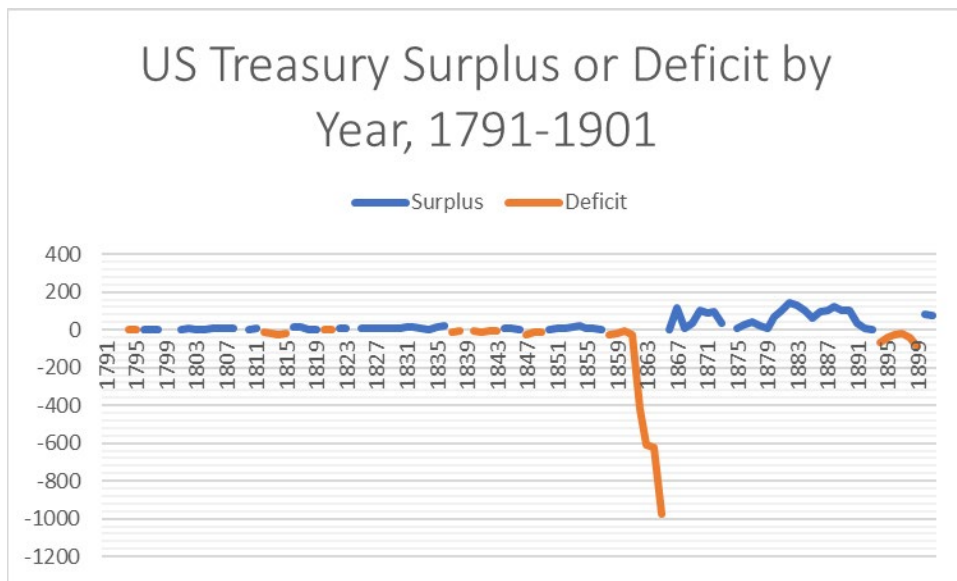


Figure C. Composition of US Treasury bullion holdings, US Treasury Report 1888 to 1893.

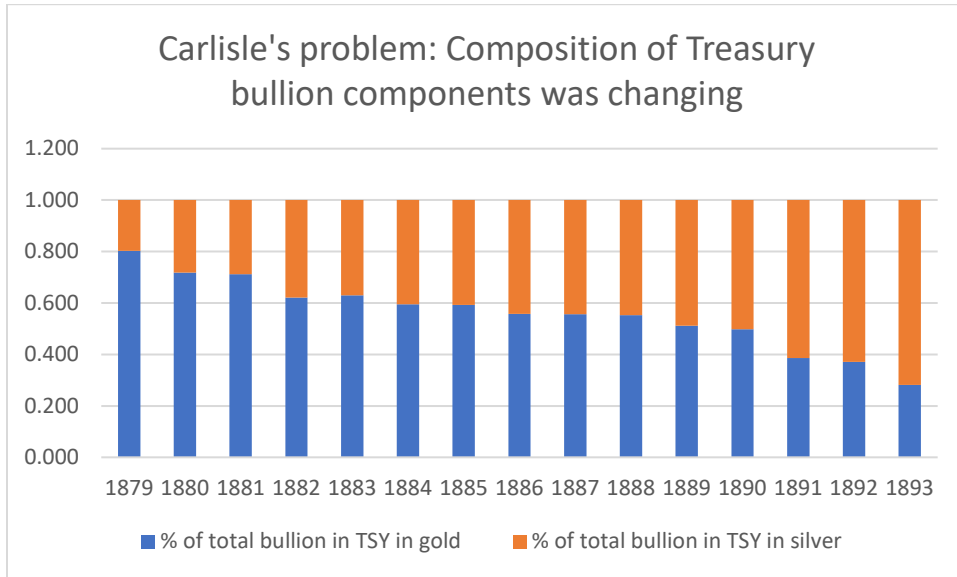
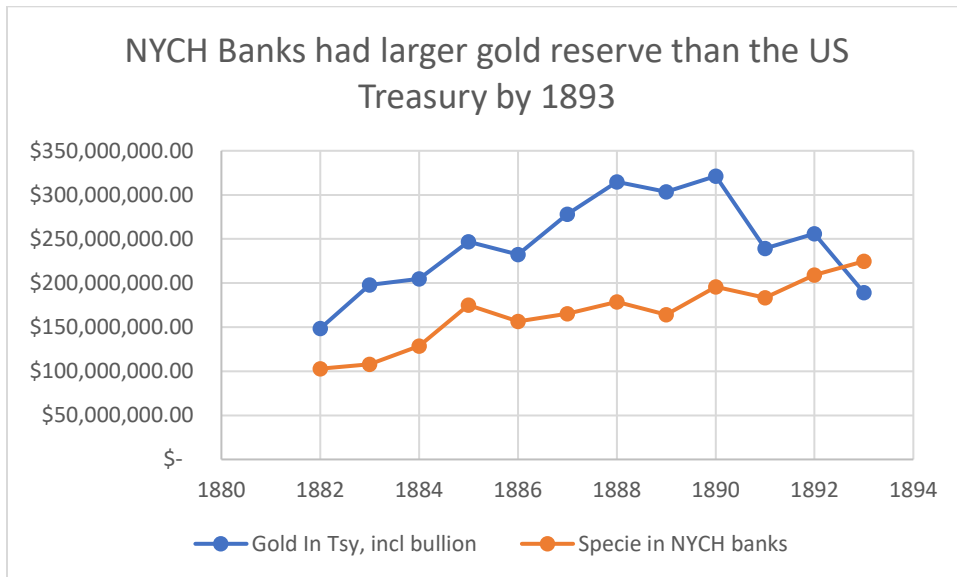


Figure D. Location of institutional gold reserves in US 1882-1883.

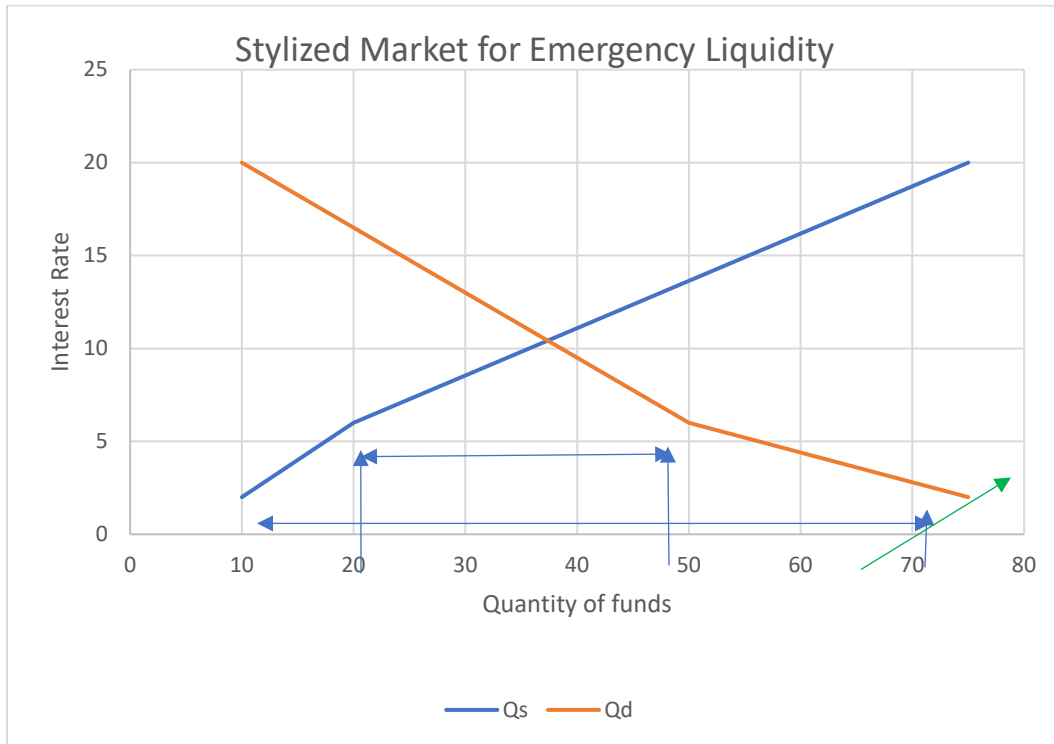


Source: Comptroller of Currency Reports, 1882-1893, Table 17

Table A: Combined efforts of two pools of collective liquidity during five liquidity crises, 1873-1907

Year of Panic. Aid provided during acute weeks	Treasury deposit of its reserves to banks, millions of \$	NY Clearing House issuance of joint loan certificates, millions of \$	NYCH Loan certs as % of NYCH reserves of gold	Combined Tsy and NYCH liquidity provision, millions of \$	Treasury proportion of total aid	NYCH proportion of total aid
1873	\$27	22.4	39.2	\$49	0.55	0.45
1884	0	21.9	not available	\$22	0.00	1.00
1890	50	15.1	16	\$65	0.77	0.23
1893	9	38.2	28	\$47	0.19	0.81
1907	89	101	38	\$190	0.47	0.53
Source: Banking Panics of the Gilded Age, Elmus Wicker, Cambridge University Press, 2000						
pp. 121, 133						

Appendix A: Supply and Demand for Liquidity in a Financial Crisis



In the Supply and Demand diagram, we see that shortages of liquidity emerge during financial crises when the supply of funds shifts back from the green supply curve to the blue curve as adverse selection informational asymmetries spread throughout the system. The normal quantity supplied of 70 at the 2% rate is no longer available to meet demand. Instead, a quantity of 38 funds at the rate of about 10% is available.

If a lender of last resort loan was created with a 2% yield, it would fail. Only funds in the quantity of about 10 would be forthcoming, leading to a shortage of $70 - 10 = 60$. Either the risk in the facility would have to be reduced so that the supply of funds would increase to its normal quantity at 2%, 70, or the facility would have to be priced at 10% to acknowledge the risks in the environment. Investors who were satisfied that 10% provided adequate compensation for the systemic risk would supply a quantity of 38 funds, still less than normal, but perhaps adequate to shore up the system until larger risks could be mitigated.

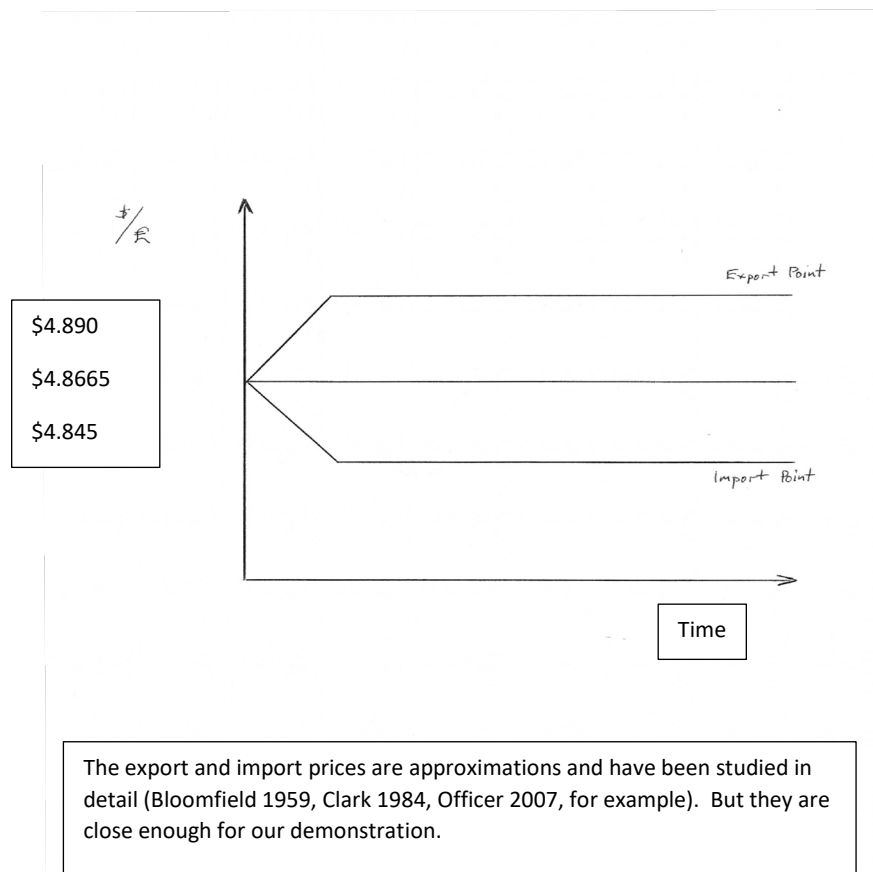
Appendix B: The Workings of the International Gold Standard: Three Scenarios

The international gold standard before WW I was an intricate mix of administered prices and private market arbitrage, one that worked. How well it worked is a question we leave for other researchers. But how it worked is worth understanding, specifically for understanding financial decisions made by private actors and for political decisions made by government officials.

The gold standard was built on two prices administered by the US Treasury and the Bank of England. Although other countries were part of the international gold standard in the late 19th century, we focus on the United States and the United Kingdom for simplicity.

The US Treasury promised to pay one ounce of fine gold to anyone who wished to redeem \$20.6718 in US notes (or fractions thereof), or it would pay the equivalent in gold coin to anyone who brought in the equivalent weight of gold billion. The Bank of England would pay one ounce of fine gold to anyone who redeemed £4.2477 in bank notes. These two prices implied that \$4.8665 exchanged for £1. But the parity exchange rate itself did not formally exist in any market; it was just an implication of the two administered prices. Dollars and pounds exchanged at the market rate. Similar calculations held for other countries following the gold standard.

These two administered prices formed the basis for a system of fixed currency exchange rates. Indeed, the exchange rate itself fluctuated in response to changes in the supply or demand for dollars or pounds over the course of international trade. Furthermore, if you brought \$4.8665 in notes to the Treasury or the Bank of England, neither was obligated or even likely to exchange them for £1, or the other way around. This is where foreign exchange specialists, private businessmen, came into play. Their constant efforts at arbitraging the differences between the implied fixed exchange rate and the actual fluctuating market exchange rate between dollars and pounds kept the market rate from straying too far from the implied rate.



The “gold points” guided arbitrage. If the exchange rate strayed above the export price, gold dealers in the US would ship gold to the UK. If it strayed below the import price, dealers would import gold to the US (all examples are taken from the perspective of the US). This arbitrage would lower or raise the exchange rate back within the gold point spread. The actual exchange rate floated around inside the gold points and itself was not fixed. The above diagram illustrates the gold points.

Exporting Gold

If the exchange rate drifted above \$4.890, perhaps because the demand for pounds had increased, foreign exchange dealers in New York would buy dollars at more than \$4.890 per pound with appreciated pounds that they had accumulated over the course of trade, take the dollars to the Treasury (the New York subtreasury most likely), and buy gold at the administered price of \$20.6178 per oz. The gold would then be shipped to the UK and converted into pounds at the Bank of England at the administered price of £4.2477 per oz. The arbitrage profit arose because at exchange rates above \$4.8665, pounds bought more dollars than necessary to buy an ounce of gold at the administered price at the Treasury. Suppose the dealer buys \$489 for 100 pounds. That buys him 23.72 ounces of gold at the Treasury. But needs to send only 23.60 ounces to the Bank of England to buy his 100 pounds back. The deal leaves him with 0.12 ounces of gold

left over or \$2.474 if converted to dollars at the Treasury as gross profit on the deal. If enough dealers did this, the increase in demand for dollars would arbitrage the exchange rate below \$4.89 and the exports would cease. Silber (2007) provides a detailed demonstration of all the steps that a foreign exchange dealer in New York went through to make an arbitrage deal.

Importing Gold

If the exchange rate fell below \$4.845 per pound because the demand for dollars had increased, just the reverse would happen. The dealer would buy pounds at less than \$4.845 per pound with appreciated dollars, take the pounds to the Bank of England and buy gold at the official price of £4.2477 per ounce, ship the gold to New York, and convert it to dollars at the Treasury at the administered price of \$20.6178 per ounce. The arbitrage profit arose because at exchange rates below \$4.8665, dollars bought more pounds than necessary to buy an ounce of gold at the administered price at the Bank of England. Suppose the dealer buys £20.6400 for \$100. That buys him 4.8591 ounces of gold at the Bank of England. But he needs to send only 4.8376 ounces to the Treasury to buy his 100 dollars back. The deal leaves him with 0.0215 ounces of gold left over or £0.0909 if converted to pounds at the Bank of England as gross profit on the deal. If enough dealers did this, the increase in demand for pounds would arbitrage the exchange rate back above \$4.845 and the imports would cease.

The gold points reflect the fact that shipping gold had costs, including shipping, packing, insuring, and interest costs on the voyage. Not all deviations from the parity rate instigated gold flows.

The Currency Premium

The currency premium was a phenomenon found most often in the US during the panics of the National Banking Era. During a panic current would trade at a premium relative to deposit money. For example, if you wanted \$100 in currency, you would have to debit your deposit account \$104. This four percent premium would overwhelm the gold points and cause gold to flow into the US from overseas regardless of the actual exchange rate. The premium raised the gold import point above the usual gold export point. For example, if the currency premium is 4 percent, the import price will be $(1.04) * \$4.845 = \5.039 . This is well above the usual export point of \$4.890, causing gold to flow in unless the market exchange rate was above \$5.039, which was highly unlikely. Gorton and Tallman (2018, pp. 205-207) present a detailed account of the premium.

The Unconventional Asset Market at the BoE

It is true that the Bank of England was required to buy and sell gold at the administered price of £4.277 per ounce, giving the impression that it was unable to alter its gold holdings independently. More specifically, the BoE was required to convert its banknotes into sovereigns at the fixed legal rate. The BoE was also required to buy gold bars at or above the legal minimum price, but not above the mint price.

But this applied only to bullion purchases and sales, that is, conventional gold assets. It could buy and sell unconventional gold assets, foreign gold coin primarily, in attempts to rebalance its gold portfolio (Simon, Ugolini, Officer). Over 70 percent of its foreign coin stock was US \$20 Gold Eagle coins. While the volume of gold eagles at the BoE varied considerably, at the end of 1895 it held about \$73 million in Eagles. This is substantial when compared to the desired volume of gold of \$100m the US Treasury was trying to maintain as a minimum. In both cases, however, the BoE could not initiate trades; it could just be available to buy or sell these assets. This like the discount window at the Federal Reserve; it is open but not trading on its own account.

The BoE's ability to manipulate the price at which it would buy or sell unconventional assets is important in the story of how Morgan fought the run on the Treasury's gold stock in the mid 1890s. Morgan apparently had the influence to convince the BoE to alter the price at which it dealing in US gold eagles.

To keep gold from flowing into the UK from the US, the BoE could do two things:

- 1) It could lower its bid price, the price at which it was set to buy US Eagles (unconventional assets). This makes importing coins from the US less attractive. This raises the import price of the gold points.
- 2) It could lower its ask price, the price at which it offers to sell coins. This makes it more attractive to send coins to the US. This raises the export point of the gold points.

Comparative Risk Table

1895 US Gold Reserve Morgan Belmont Syndicate	1889 Banque de France Comptoir	1890 Bank of England Barings Brothers
<p>1-European bankers were not completely sure the US 4% issue was “state paper.” Congress had not approved it, which heretofore it always had. Uncertain the bond had sovereign authorization. Was the “Revised Statute of 1862, Section 3700” adequate?</p>	<p>No uncertainty about sovereign authorization because the Chancellor of the Exchequer and the Governor of the BdeF were acting within laws.</p>	<p>No uncertainty about sovereign authorization because the Chancellor of the Exchequer and the Governor of the BofE were acting within laws.</p>
<p>2-Had to rely on syndicate members to fund the loan upfront. Roths and others could back out. If they did not persistently support the forex cartel till fall, the transaction would fail.</p>	<p>Private bankers were not needed to fund the loan upfront, only if the Comptoir could not pay it back later. Comptoir paid it back without needing help from syndicate.</p>	<p>Private bankers were not needed to fund the loan upfront, only if the Barings could not pay it back later. Barings paid it back without needing help from syndicate.</p>
<p>3-The presence of profit-making opportunity to export gold tempted syndicate members and non-syndicate members during the entire five-month contract.</p>	<p>No syndicate members were tempted by potential profits to undermine the transaction.</p>	<p>No syndicate members were tempted by potential profits to undermine the transaction.</p>

<p>4-Fulfilling the contract with coin was more difficult than fulfilling it with gold ingots. It was not known ex ante if enough coin could be had.</p>	<p>Once the central bank made the loan, the syndicate members only had a contingent obligation to make up a potential loss. No ongoing commitment to find gold coin.</p>	<p>Once the central bank made the loan, the syndicate members only had a contingent obligation to make up a potential loss. No ongoing commitment to find gold coin.</p>
<p>5-Syndicate managers could be investigated by Senate after the transaction because Congress had not approved it. Reputational risk could ensue, and it did.</p>	<p>While the BdeF might be criticized for the transaction, the syndicate members were lower profile facing less risk to reputation.</p>	<p>While the BofE might be criticized for the transaction, the syndicate members were lower profile facing less risk to reputation.</p>
<p>6-The second attempt to replenish the US gold reserve by Carlisle and Cleveland had just failed, causing actual losses to buyers of the bond, even though that bond had had Congressional approval.</p>	<p>There was no history of failure of central bank efforts to forestall a systemic panic.</p>	<p>There was no history of failure of central bank efforts to forestall a systemic panic.</p>
<p>7-Morgan and Belmont faced a competing offer to organize the transaction from Speyer & Co., making it more difficult to negotiate with the Rothschilds.</p>	<p>The BdeF faced no competition in negotiating the transaction making it easier to call the shots.</p>	<p>The BofE faced no competition in negotiating the transaction making it easier to call the shots.</p>

Appendix D Note on Bond risk, prices, profits, losses, and yields.

The way to make a profit on bonds is just like how you make a profit on stocks: buy low, sell high. The process is straightforward. Take, for example, a railroad company like Union Pacific. It borrows \$1 from you and mails you a paper contract on which its promise to pay you back interest and principal is printed. The piece of paper is called a bond and Union Pacific is called the issuer. In all cases, the contract stipulates when the agreement ends, also known as its maturity date. Also, bonds pay a fixed dollar amount, whether on a coupon payment or upon maturity. But the price of a bond can change in the secondary market, changing the percent yield implied by the fixed payments.

After you receive your piece of paper in the mail, you can sell it to anyone. If Union Pacific's cargo shipping prospects worsen, and risks increase that UP may not make good on its promises, buyers may only be willing to pay you 90¢ for your \$1 bond. If risks decline and the outlook for shipping improves dramatically, making it almost certain you will get paid interest and principal on time, buyers may be willing to pay 103¢ for a \$1 bond. If you estimate the business risks of Union Pacific accurately, you make your profit by buying at 90¢ and selling at 103¢.

Why would anyone pay more than \$1 for a \$1 bond, given that the contract says the bond will only mature at \$1? If the issuer's risk diminishes significantly after its issue date, new bond buyers in the after-market may be content to lose 3 cents on their purchase if they can net that loss against fat annual interest payments, for example six cents per year. That is what happened in 1894 and 1895. Investors paid 117.5 for the Jan 1894 5% coupon bond, 117.0 for the November 1894 5% bond and 104.5 for the 4% coupon Morgan bond.

Once the bond contract is made, you, as the investor, can sell it at the Bond post at the NYSE at any time, enabling you to get your principal back before maturity date. However, bond prices go up and down every day and are quoted at amounts such as 95 cents on the dollar or 102 cents on the dollar. If you sell it at 95 cents, you'll incur a loss of your original principal. You're only guaranteed by the issuer to get your money back if you hold the bond to maturity.

If you don't invest in the bond on its initial offering date, and instead buy it in the secondary market at the Bond post at the NYSE, your yield will be greater than the offering coupon rate was if you buy the bond at a price below 100 cents on the dollar. For example, if you pay 90 cents on the dollar for a \$1,000 bond whose coupon at offer time was 5%, your current yield will be \$50/\$900 or 5.55%, not just 5%.

You can see that yields move opposite to bond prices; if bond prices are below 100 cents on the dollar when you buy, your yield to maturity will be greater than the original coupon rate. If bond prices are over 100 cents on the dollar when you buy, your yield to maturity will be less than the coupon rate (if you pay 102 cents on the dollar, you will lose the 2-cent premium upon maturity at 100 cents).

