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Evolution of US-Dollar-Centric International Money Markets and Pro-Cyclicality of Basel III Liquidity Framework

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Abstract: This thesis presents research on the evolution of the US-dollar-centric international money markets. The timeline starts from late nineteenth century US, where the New York call money market already featured a number of sophisticated techniques such as margin investing, over-certification, and re-hypothecation.

Next, I explore the evolution of the market leading up to and after the Great Depression, through the regulatory period of the New Deal, and functional finance of the late 1930s and greater part of the 1940s.

In the postwar period, I highlight the Federal Reserve's push for free markets, the sudden rise of the euro-dollar market in the second half of the twentieth century—Minsky's money-manager capitalism—and the Global Financial Crisis. Through all periods, markets evolved based on their prime directive: to make money.

The concept of "shiftability," which was introduced before the Great Depression, is now being rejected as financial institutions engage in creation and destruction of money given that their liabilities serve as money for other economic entities, and securities and bank loans are linked. Not only do loans create deposits, they also create private-sector securities.

The regulatory framework of Basel III focuses on liquidity, which is implicitly based upon the global-liquidity concept. However, as I examine in this report, the Basel III liquidity framework neglects the contribution of the government sector, and its role in stabilizing the financial system. Instead, Basel III relies on the ability of the central bank and private sector to self-regulate through ratio-based constraints so that negative setbacks arising from the endogenous character of private liquidity, meaning debt deflations, are avoided. However, Basel III failed to recognize that the (i) money hierarchy is multi-tiered, and (ii) liquidity preference has a role in asset-price changes. Given these shortcomings, the Basel III liquidity framework does not contribute to counter-cyclicality, rather it extended the existing pro-cyclicality bias of international financial regulation.

Keywords: hierarchy of money, liquidity preference, endogenous money, Modern Money Theory, money-manager capitalism, collateral-based finance, US dollar money markets, international money market, Eurodollars, New York call money market, impersonal money market, innovations, bankers acceptances, dollar acceptances, over-certification, re-hypothecation, repurchase agreements, repos.

JEL Classifications: E12, E44, E58, F33, F34, F53, F62, G01, G15, G21, G23, G24, H63

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INTRODUCTION

The role of the money market has not changed much from Burgess's 1927 description:

> "The [money-market] importance lies rather in the liquidity of the market, in its capacity for furnishing cash at a few hours' notice. What a bank balance is to the individual, the money market is to the country's credit system. Both represent ready cash available for immediate needs."
> (Burgess, 1927, p. 111)

In addition to its core function of providing ready cash to participants, money markets play other important functions. Motivated by profit-seeking, they promote the evolutionary changes of institutions involved in their operations. They also create a monetary-commitments bridge between money today and money tomorrow. Because trading is intra-day, and has been since the 1900s at least in "intimate" corners, this bridge connects money now with money a few hours later.

Over the decades, recurring crises originating in the finance industry proved that the unit of account of monetary commitments adds to the inherent instability of these complex financial structures devoted to money-making. Driven by trade globalization, in response, finance became internationalized. In this thesis, I examine these developments from the inception of markets through to the present day.

In the years leading up to the Global Financial Crisis of 2007–08 (GFC), the US dollar money markets could be described as the integration of Fed funds onshore and euro-dollars offshore. Both were "liquidity lubricants" with Fed funds being the core of the US money market, and euro-dollars an "extension of" or "integrally related to" Fed funds (Stigum & Crescenzi, 2007, p. xvii). Spreading across major financial centers worldwide, the money market is celebrated as a cornerstone of globalization and international capital flows.

Since the GFC, money markets have attracted more scrutiny and debate. In assessing risk, there have been sporadic attempts in mainstream academic literature to separate the offshore part of this integrated money market from the US economy. The basis of the argument is that this

market is outside the authority of the US Federal Reserve, and, hence, uncontrollable. Therefore, policy recommendations have revolved around international reserve requirements (Fowler, 2014). However, the GFC exposed weaknesses of the US-dollar cross-border money markets that were eventually taken up by Basel III, a uniform set of rules and regulations that most nations have adopted. In Chapter 4, I examine the liquidity framework of the Bank for International Settlements (BIS) based on the analysis found in certain publications (BIS, 2011), (BIS, 2013) and (BIS, 2014). I also explore the origins of the US dollar money market, and its eventual international outreach. I review the modern-day approach by the principal regulatory agency, the BIS, in their attempts to create an economic structure that is resilient in time of downturns and crises. At the end, I offer a critique of the Basel III liquidity framework on the grounds of its pro-cyclicality.

The structure of this thesis is as follows. Chapter one examines the evolution of the New York money market before the Great Depression, paying attention to the call money market. Chapter two is about the evolution of the New York money market under New Deal regulations and during the war finance period that lasted through the second half of 1940s. Chapter three focuses on the sudden evolution of the international money market in the postwar period. This chapter examines the issues that are at the crux of this thesis. These include a push for free markets by Federal Reserve Chairman Martin for government securities in the early 1950s, and the spectacular rise of the euro-dollar market in the 1960s-70s, and its transformation into an established international system with the US dollar as the major unit of account of financial institutions.

Of this period Minsky stated, "At any time, a vast international network of payments denominated in monies exists."[1] He is suggesting that the international money market is available at any time, not only for businesses, but even for the average person when travelling internationally.

At the same time, Minsky observed that the . . .

> ". . . [C]urrent structure of international banking […] is dominated by a wide network of mostly dollar-denominated bank debt. Such debt need not be of US-chartered organizations,

[1] (Minsky, Central Banking and Money Market Changes: A Reprise, 1984, p. 4)

> the dollar assets a bank owns need not be the debt of a US entity, and the holder of bank debt as an asset need not be a US citizen. […] why is "dollar money" is accepted? Given that there are as many different "bank dollars" as there are banks with dollar deposits, why does anyone in his right mind accept a bank dollar in exchange for an intrinsically valuable good or service? The answer comes in two steps: any bank dollar is convertible at par into any other bank dollar, and a significant set of units are committed to earn bank dollars in order to fulfill their obligations on debts that are owned by banks. Bank dollars are valuable because units are operating in the economy to get bank dollars so they can pay bank debt, and in the process destroy bank dollars." (Minsky, Money and the Lender of Last Resort, 1985, p. 15)
> "[…] economic system systems with complex intertemporal and financial linkages are unstable." (Minsky, Global Consequences of Financial Deregulation, 1986, p. 7)

Chapter four is an analysis of the liquidity framework under Basel III where particular attention is paid to the concept of liquidity used by the BIS. I contrast this with concepts developed by Levy Institute scholars spanning from Keynes to Minsky, and from Kregel to Wray, and their views on how liquidity preference plays a role in determining asset prices.

Chapter five reviews the BIS concept of global liquidity, which is part of the foundation of the Basel III liquidity framework. I point out shortcomings of this approach, such as the failure to take the government sector into account, ignoring the hierarchy of money, and how liquidity preferences cause changes in asset prices.

And finally, I offer conclusions and policy recommendations, along with a literature review of the sources used for this paper.

LITERATURE REVIEW

The US Dollar and New York City as Entrepot of International Money Markets

By the beginning of the twentieth century, New York was fast becoming a financial powerhouse. According to Allan Sproul, President of Federal Reserve Bank of New York (1941–56), "the first and most direct point of contact between […] national and international money and capital markets is in New York" (Sproul, 1980, p. 125).

According to Kreps, it was the active acceptance market that elevated the US dollar to international prominence, making New York the financial entrepot of international money markets. "Broad acceptance powers" were granted to American banks "to aid in establishing the dollar as international currency, and to promote the development of an international money market in the United States." As a result, by "extend[ing] dollar acceptance credits" the American banks aided not only in financing the foreign trade of the United States, but also the trade between foreign countries (Kreps, 1952, pp. 22-23).

Paul Warburg attributed the internalization of the US dollar to the US's "work [and] reconstruction" overseas after World War I (Warburg, 1930c). In 1919, while addressing the National Association of Credit Men in Detroit, Warburg asserted that, "In South and Central America, Asia, and in Europe […] the dollar acceptance, and "dollar exchange," for which four years ago we modestly and prayerfully entreated a kind consideration, through force of circumstance have now been brought to a leading position" (pp. 634, ibid).

In its first annual report in January 1916, the Federal Reserve Bank of New York stated that its intention was to have the US dollar accepted internationally on par with the British pound, its major competitor at the time. To this end, the Federal Reserve enacted policies such that New York became the place to discount US dollar bankers' acceptances "at a rate lower than the rate for the sterling acceptances in London" (Federal Reserve Bank of New York, 1916, p. 15).[2]

Ten years on, the US dollar had achieved a near hegemony to the extent that according to Warburg, "foreign central banks are the largest holders to-day of American bankers' acceptances [as of December 11, 1928[3]]" (Warburg, 1930d, p. 870). In a similar vein, Madden et al. pointed out "the establishment of the Federal Reserve System in 1913, which among other things, made

[2] One year later, the second annual report by the Federal Reserve Bank of New York published on January 1, 2017 contained the following paragraph showing progressive international usage of US dollar as unit of account via means of bankers' acceptances: "Some progress has been made during the year in the development of a discount market. Responsible banking and brokerage houses have become dealers and specialists in bankers' acceptances, purchasing them at wholesale as they are accepted and offered in this country, quoting rates by cable to foreign countries where they originate as bills of exchange, and contracting for their purchase upon arrival here. *This is giving an increasing currency and stability to the "dollar" bill in the foreign markets*." (Federal Reserve Bank of New York, 1917, p. 13), emphasis edited.

[3] Date of speech by Paul Warburg at the Tenth Annual Dinner of the American Acceptance Council.

possible the creation of broad market in bankers' acceptances" was first and foremost the factor behind "the rapid growth of New York as an international center" (1948, p. 186).[4]

Usage of the US dollar grew over the 1950s and 1960s due to, according to Roosa (1970) the convertibility of current-account payment transactions among major economies, and to the parallel development of the "internalization in the flows of short-term capital among nations." Although long-term capital movements were still under "relatively tight control", a growing volume of "current account transactions" vital to international trade required assurance that short-term financing was standing ready to support those transactions. Since the early 1960s and through the 1980s, the largest American banks were busily creating third-country acceptances. These were provided to "foreign borrowers and foreign banks, mostly in Japan, and, to a lesser degree, Korea and Latin America" (Melton & Mahr, 1981, p. 42).

In the mid-1960s, Charles Coombs of the New York Federal Reserve observed that the US dollar had achieved a "central role […] in international finance" and that "international liquidity […] is often effected through debits and credits" with the US dollar serving as the unit of account (Coombs, Letter, Charles Coombs to Allan Sproul, 1964, p. 1).

According to Roosa, the orderly flow of international business "created urgent demand for the use of a single currency as an international transaction vehicle" and "[t]the dollar met much of that demand." He credits acceptance of the dollar, in part, to "a rapid spreading of branches of American banks overseas" (Roosa, 1970, p. 176).

This may have been true, but there were other factors contributing to the dominance of the US dollar in international business. (Koszul, 1970) and (Shapiro & Deastlov, 1970) point to the importance of the development of the euro-dollar market by financial institutions outside of the US. This market began in the early 1950s and "had grown among non-American banks, particularly European banks." The success of these banks "soon provided a new stimulus to American banks' activity in Europe" as they started "to seek participation in this market" (Koszul, 1970, p. 279). This development calls to mind Minsky's observation about "the

[4] As evidence of rapid growth of US dollar-based creation of bankers' acceptances to facilitate foreign cindustrial development, Melton ,et al, provide an example of Petroles Mexicanos (Pemex), the Mexican petroleum producing and refining firm, arranged a $4 billion acceptance facility (equivalent of $10 billion today) with a consortium of 82 banks. At the time, this was the largest such facility globally (Melton & Mahr, 1981, p. 42), see footnote #3.

endogenous nature of money and the impossibility of managing money by trying to control the quantity of some specific set of debts" (Minsky, 1982 [2016], p. 72). Due to their more aggressive business tactics, US banks came to dominate the euro-dollar market, in pursuit of their prime directive to "make money" (Koszul, 1970, p. 289).

US Dollar Money Markets under Minsky's Finance Capitalism

During the 1910s and through the 1920s, there was much debate in the US over improving the monetary system by following the best practices of the time in Europe, especially Great Britain, France, and Germany. Paul M. Warburg, a former investment banker who later become chairman of American Acceptance Council, and Earl P. Carman, a businessman from Pittsburg who held a seat at the Pittsburg Chamber of Commerce[5] were on one side of the debate. An early advocate of creating the Federal Reserve system, Warburg, in particular, was in favor of wider usage of the practice of central bank discounts of bills of exchange or trade acceptances (Warburg, 1930a) (Warburg, 1930b), (Warburg, 1930c). Although less is known of Carman's positions, he, too, was in favor of the wider use of trade acceptances (Carman, 1915) (Carman, 1916). On the other side of debate were economists like Chicago-based Harrold G. Moulton, who preferred to see an extension of the existing business practices in credit matters (Moulton, 1918c). This literature is interesting for several reasons.

Both Warburg and Carman[6] were critical of the prevailing credit methods in the US. They preferred the European system that separated "commercial credits" and "investment credits." To

[5] In fact, there were numerous examples of promotional and educational articles in the specialized journals written by American businessmen, who themselves enthusiastically embraced trade acceptances in their business practices. Alongside with Earl P. Carman there was an example of W. S. Allan, assistant manager Fisher Flouring Mills Company, who wrote a detailed account of trade acceptance use in the business firm the author was working for (Allen W. S., 1918).

[6] Earl P. Carman was a Pittsburg entrepreneur, who dealt himself with prevailing credit methods of the day. There is record of him taking part in the court proceedings on December 13, 1909 as plaintiff, which was a dispute between two companies (Pittsburg Legal Journal, 1910, p. 372). In 1915, he wrote an article titled "The Change in Credit Methods Made Necessary by the Federal Reserve Act" which was published in the *Commercial and Financial Chronicle*. This writing turned out to be so prolific that it attracted attention of Herald G. Moulton from University of Chicago to such an extent that the latter regular referenced to it. Thus, Moulton mentions it his series of articles under one title "Commercial Banking and Capital Formation" published in 1918. A book *Principles of Money and Banking* edited by Moulton and published in 1917 by University of Chicago publishing house has two entries, which were derived from the Carman's article.

the banks, these credits were "quick assets" and "slow assets," respectively. Hence, the banks relied on "commercial credits" as self-liquidating short-term assets that were readily convertible into ultimate means of payment[7] upon maturity, which could be sold in the market, or could be re-discounted at the central bank. At this time in the US, the most wide-spread method of obtaining credit by businesses was the "open book account."[8] This form of credit allowed an aggressive borrower to over-extend and not honor the original terms of the note and, hence, regularly caused disputes between borrowers and lenders. (Allen W. S., 1918, p. 78). Before the creation of Federal Reserve System, commercial credits could only converted into ultimate means of payments upon maturity. They were called "frozen", "immobilized," and "slow" assets. As Carman argues, American bankers relegated commercial credits to a secondary position, and looked for a means of making loans that could be converted into ultimate means of payment whenever desired. That financial innovation was the demand, or call money market operated on the New York Stock Exchange. This market provided short-term loans redeemable on demand against collateral that could be easily sold in the open market. Collateral consisted of stocks and bonds traded on the stock exchange. The Exchange "furnished constant market quotations for such collateral and provided a means of selling it *instantly* should the banks desire to do so"[9] (Carman, 1915, p. 1397).

The establishment of the Federal Reserve System in 1913 was an attempt to create more efficient credit methods. However, businesses were slow to make the change, despite the fact that the

[7] Those "credits" were trade acceptances. According to Warburg, "[a] trade acceptance is the obligation of a purchaser to pay to the seller the price of goods bought; it represents, as it were, a loan of goods." (Warburg, 1930c, p. 638).

[8] According to the article in *Journal of American Banking Association* dated August 1918, "The "open account," briefly, meant an abuse of terms of sale, loss of interest, unearned discount, unjust claims, bad debts, all of which meant disputes, disputes, disputes" (Allen W. S., 1918, p. 78). The same article tells: "Practically all sales were on "open account" and the terms were 2 per cent, ten days, or thirty days net. The terms, however, were abused and really meant nothing. The discount period was interpreted in the cities as 2 per cent, on the 10th of the following month, which at times might mean, if a sale were made on the 2nd of the month, 2 per cent, in forty days or a discount in ten days more than the net terms. In the country 2 per cent, in thirty days was usually taken. This abuse of the discount naturally caused an abuse of credit and many accounts ran sixty and ninety days and even longer. This condition required constant dunning on the part of the collection department and the assistance of the sales department to collect these delinquent accounts. Using salesmen as collectors reduced their efficiency. Old accounts led to numerous unjust claims. Long credits meant a large list of bad debts" (ibid.)

[9] Emphasis is added.

Federal Reserve System allowed trade acceptances for rediscount from member banks. The call money market and the credit, although deemed inefficient by Warburg, Carman, and others, survived World War I, and were still used during the 1920s (Griffis, 1925). Warburg considered this system as highly unstable because interest rates fluctuated due to the lack, first of all, of elastic supply of reserves from the central bank (Warburg, 1930a, p. 14). To Carman, the entire structure of business credit, which was ultimately based on the call money market, was a hunting ground for commercial sharks (Carman, 1915, p. 1398). Abuses occurred even inside the call money market, as Griffis details. There were two interest rates in the market: the market rate, which was applied to new loans, and a renewal rate that was applied to old loans. As the market rate was determined during the trading day, the general rule was that if a borrower and lender did not communicate with each other during the day, the rate of interest charged on old loans remained the same. Hence, it was the lender who had to reach out to the borrower to re-negotiate the renewal rate if the current market rate went up, and if interest rates declined, it was the borrower who had to reach out to lender. However, "[i]t is said that certain of the money brokers made good returns on their money invested in call loans by making it very difficult for the borrowers to get in touch with them if there was a drop in the rates." "Perhaps their telephone line would be busy or they would be occupied so consistently at such times that the borrowers were not able to get in touch with them" (Griffis, 1925, pp. 29-30).

Warburg observes that the prevailing practice in the call money market was to settle trades daily. In effect, call loans ran for a minimum of one day with settlement the next day, and termination on demand. This was among the reasons why interest rates could "jump from 4 per cent to 100 per cent" or even to such high rates that money "may not be secured at all" (Warburg, 1930a, p. 18). Moulton (1917) provides empirical evidence of sharp spikes of interest rates in the call money market of New York.[10] Against this background, Warburg argued that instead of the

[10] According to Moulton (1917, p. 85), "[t]he rates on call loans are subject to very wide fluctuations. Originally they are lower than any other rates, ranging from 1 to 2 or 2½ per cent, but on a few occasions they have gone beyond 100 per cent. The call rate rose to 127 per cent on October 29, 1896; to 96 per cent on November 2, 1896; to 186 per cent on December 18, 1899; to 75 per cent on May 9, 1901; to 125 per cent on December 28, 1905; in 1906 to 60 per cent on January 2; to 30 per cent on April 5 and 6; to 40 per cent on September 5, and to 45 per cent on December 31. […] as a matter of fact there is a greater profit accruing to banks when the call rate is 3 or 4 per cent than it is 25 or 30 per cent. When money rates reach these high figures many corporations and large individual depositors are tempted to withdraw their funds from the banks in order to make loans to borrowers directly. This depletion of the banks' reserves at a time when money is generally tight more than counterbalances the high returns

volatile system of daily settlement, the US would be better off if it adopted the system of settlement practices in Europe where trade settlement was less frequent and produced a much smoother trajectory of interest rates. In Europe, trades settled twice a month. However, this did not eliminate abuse. There were many such cases, especially on the Berlin Stock Exchange.[11]

The other side of the debate was dominated by economists at the University of Chicago led by Harold Moulton. They argued that prevailing business practices in the US were such that one cannot clearly distinguish between "commercial credits" and "investment credits"[12] (Moulton, 1918a) (Moulton, 1918b). They made the point that instead of demand for short-term credit there is continuous demand for working capital, and credit based on trade acceptances was not superior to credit based upon stock exchange collateral. The key take-away was that bank assets based on collateral that are instantly sellable via open market have a unique feature: "shiftability" as these assets were shiftabile (Severson, 1934, p. 275). To Moulton, "[l]iquidity is tantamount to shiftability" (Moulton, 1918c, p. 723). But regardless of which side one was on, it was evident that the motive of the bankers was profit-making. This motive could reach such extreme proportions that any type of restraint became subordinate.[13]

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on the loans they may make on call. Because of this some banks in New York have made it a rule never to loan money on call at more than 6 per cent."

[11] This account provides a brief record of speculative activities at the Stock Exchange in Berlin in the 1910s: "The most popular media of speculation were the account transactions which did not have to be settled until the end of the month, and consequently afforded the opportunity of making a profit on a deal—whether purchase or sale—by a second sale or purchase." (Schacht, 1955, p. 107).

[12] Carman responded to this claim by following explanation, which is worth noting, "When used for commercial purposes, the promissory note usually represents a combination of commercial credit and investment credit. In other words, the proceeds of the note are usually used partly to pay commodities of trade which will be re-sold and partly to pay for permanent fixtures or improvements which will never be re-sold while the business of the borrower continues. A promissory note representing funds thus employed in not re-discountable under the provisions of the Federal Reserve Act, and that portion of it which actually represents commercial credit is, therefore, not convertible into cash until the note matures. Consequently, the whole note must pay the higher rate of interest charged for non-convertible loans […]" (Carman, 1915, p. 1397).

[13] Melton, et al, argues in 1970s and early 1980s that domestic acceptances, which were favored by Warburg and Carman during their educational and promotional push before Great Depression, were "least utilized type of trade-related acceptance, representing only about 3 to 6 percent of total outstandings." They attribute this to the "additional burden required for funds raised from sale of domestic shipment acceptances to exempt from reserve requirements". Also, open-account financing remained the more popular method of credit for domestic trade in the United States (Melton & Mahr, 1981, p. 42).

Moulton, at least, came to this conclusion: "[there is] superior market for conversion of collateral into cash, which is afforded by the stock exchange" (Moulton, 1918c, p. 713). Similarly, Carman observed the relationship between the money market and stock market[14] was about "instant" conversion of collateral into cash. He further articulated that it was the preference for demand money, which is money-like financial instruments, which encouraged the creation of collateral of actively traded stocks and bonds (Carman, 1915, p. 1397).

Many others have weighed in on this subject over the years: (Pratt, 1903), (Moulton, 1917), (Griffis, 1925), and (Myers, 1931). There were numerous arrangements held between stock-market dealers and banks that reveal endogenous money creation, as well as close interrelations between short-term credit market and the stock market. In particular Pratt, and even more so, Myers, describe the New York Stock Exchange as a vehicle of credit money and not of commodity money. Margin investing[15], "re-hypothecation", and "over-certification" that evolved over time into "morning" credit lines are prime evidence of the intimacy between stock dealers and Wall St. banks.

Despite the cycles of boom and bust of the early twentieth century, money theoreticians fell short of grasping that, as Moulton defined it, liquidity as shiftability of assets was not the general case. It took the stock market crash of 1929 and the Great Depression, for debt deflation (Fisher, 1933)

[14] Moulton, editor of the voluminous book *Principles of Money and Banking*, provides a section titled "Collateral Loans and Stock Exchange Speculation" (Moulton, 1917, pp. 85-89), which by itself is an adaptation of a description of the stock market borrowed from the book *The Work of Wall Street* written by Pratt and published in 1903. Here, one reads that there was "clearly the close intimacy existing between the money-market and the stock-market" (pp. 86, ibid).

[15] The Wall Street practice of margin investing was developed, at least, around very late nineteenth and very early of twentieth century and the margin size (down payment) was as low as 10 per cent as documented by Pratt in the book *The Work of Wall Street* published in 1903 (Moulton, 1917, p. 85). The investing example discussed by Pratt was an "11-point margin" investment. Later on, however, description of the margin stock investing on the eve of Great Depression was mentioning of the "20-point margin" (Allen F. L., 1931, p. 315), which was a financial phrase meaning a 19% down payment for the value of a stock with a standard lot of 100 shares. The literature on the New York Stock Exchange practices soon after the 1929 crash provides evidence of higher margin size – such as "50-point margin" as implied by the investment example in (Meeker, 1930, p. 182), where down payment was 30% of the market value of purchased stock lot of 100 shares. The investment practices during the Florida's land plots boom also witnessed margin investing in the form of down payment and the size of the margin (down payment) was, too, at 10 per cent as documented in (Galbraith, 2010, p. 189). In both instances, the principle of profit-seeking investment was similar as investor was, as Galbraith put it, expecting "asset was gaining in value by the day and could be sold at a handsome profit in a fortnight." (ibid.)

(Minsky, 1994) and liquidity preference (Keynes, The General Theory Of Employment Interest And Money, 1936), coupled with endogenous money approach (Wray, 1992)[16], to become accepted by money theorists.

The second half of the 1920s was a heyday of plentiful liquidity in the New York Stock Exchange (Miller, 1991, p. 46). It is vividly illustrated by then member of the NYSE William McChesney Martin, Jr., who later served as chairman of Federal Reserve System from 1951-70. Writing in 1932, in defense against mounting public discontent over short-selling practices, Martin refers to "one prominent and well informed floor trader" who told of his own experiences of what made the stock market "break" in 1929. This floor trader was "caught long"[17] at the time, and felt sorry for everyone involved. The near-perfect liquidity of the market before it broke is described thusly by the now-sobered trader: "What could I do […] but follow the band wagon when I discovered to my sorrow that to sell short several thousand shares of a medium-priced issue was like throwing fish to a sea lion, and while I worried about having such a large possession, some chauffeur or gardener probably bought my entire line and slept soundly dreaming of the *money* he'd send his folks in dear old Ireland"[18] (Martin, 1932, pp. 6-7). Martin's paper serves two purposes. First, it provides additional evidence of the importance of prompt access to liquidity for depositing and withdrawing personal capital on the New York stock market for "any individual" (Miller, 1991). Second, it underlines that *making money* was the primary motivator of financial innovations that created and supported liquidity.

US Dollar Money Markets under Minsky's Managerial Welfare-State Capitalism

Since enactment of New Deal policies under President Franklin Delano Roosevelt in the early 1930s and through the post-war period of the late 1940s, the New York money market sharply departed from the past. Operations that had been connected to stocks were replaced by government securities, which became a "principal earning asset of commercial banks and of many other financial institutions" (Madden, Nadler, & Heller, 1948, p. 3). To Sayers, the most

[16] It should be noted here that Moulton, while expounding his "shiftability" approach that lately was picked up by Mehrling (2011), was nearly approaching the debt deflation theory but his exposition of what happens with bank assets in a crisis (Moulton, 1918c, pp. 730-731) fell short of one made by Fisher and Minsky.

[17] Long position in the securities issue means the trader owned the securities at that moment of time.

[18] Emphasis is added.

important characteristic was: "[the] government paper [was] the staple diet of the money market" (1957, p. 142). Sproul referred to this period, especially during 1939-49 as "War Financing" (1951, p. 300). Among US policymakers, there was "a significant crystallization of the responsibility of the credit authorities for "orderly" conditions in the government securities market" (ibid., p. 298). It was decided that "[US] Treasury […] should borrow at stable not rising rates of interest" (ibid. p.300).

At the time, there was debate over the optimum size of excess reserves held by banks. Outsized excess reserves created on the back of the 1937-38 business slump, and the federal government's subsequent "substantial deficit" and the "stream of incoming gold", were deemed as inflationary (ibid, pp. 298-299). This led to institutional changes to guarantee orderly functioning of the US money market. A new method of selling government bonds was adopted[19] after a "near failure" of government bond placement in October 1942. A few months before, in April 1942, the FOMC issued an announcement directing "the Federal Reserve Banks to purchase all Treasury bills that might be offered to them on a discount basis at the rate of 3/8 per cent per annum." In August of that year, another directive was issued by the FOMC announcing that a seller of Treasury bills to a Federal Reserve Bank was guaranteed that the Federal Reserve Bank would resell to him Treasury bills of like amount and maturity at the same rate of discount. In effect, "ninety-day Treasury bills in the hands of commercial banks were the same as cash. The initiative with respect to the use of reserve funds was transferred from the reserve banks to the commercial banks, the need for "excessive" excess reserves was erased, if it ever existed, and the fluidity of funds available in all parts of the country was increased." The imposition of fixed interest rates on government securities to support the war effort ranged from "3/8 of 1 per cent on ninety day bills to 2½ per cent on 20-25 year bonds" had ended (ibid., p. 303).

As the US economy entered the post war period, Sproul recognized that limits put on profit-seeking activities of private financial institutions likely would not hold. His predictions were realized early in the 1950s, when the US money market underwent swift changes.

[19] Instead of quick subscription for government bonds lasting one or two days, the period drive method of bond subscription was introduced. It involved borrowing large amounts at longer intervals.

US Dollar Money Markets under Minsky's Money-Manager Capitalism

William McChesney Martin Jr., Chairman of Federal Reserve (1951-70), provides an illuminating account of "the transition to free markets" in the US financial sector. He once remarked "[the Federal Reserve] System is, and always must be, subject to the will of the Congress" (Martin, 1953, p. 3). Throughout his long career, he made a strong push for greater freedom for the private financial sector to carry out price discovery in a range of securities, including those issued by the government (1952), (1955), (1961a), and (1961b). His papers on the subject provide a glimpse into the values Chairman Martin held. Interestingly, he had a somewhat dim view of academic economists. In one paper, Martin comments that one "will not get any [of good ideas] from talking to professors of economics" (1935). A good story-teller, Martin would strengthen his viewpoints by sharing the wisdom and personal experience of New York Stock Exchange floor traders. In his paper defending short sellers (1932, pp. 6-7) he quotes a "prominent and informed trader." In another he recalls "a little trader for whom I had great respect and with whom I talked to a great deal" (1952, p. 12). This warmness towards private finance[20] was reflected in the Martin Report, produced in 1952 by the Federal Open Market Committee.

The Martin Report, produced by the Ad Hoc Subcommittee on the Government Securities Market, is widely recognized as milestone in US monetary policy (Mehrling, The new Lombard Street: how the Fed became the dealer of last resort, 2011). It was an extension to the Accord reached in 1951 between the Treasury and Federal Reserve on separating monetary policy, the responsibility of the Federal Reserve, from debt management, the responsibility of the Treasury. The 1952 report introduced several new operational details. Among them were 1) abolishing the commitment for a pegged "pattern of rates" on government securities; 2) creating a new

[20] Upon retirement from the Federal Reserve System, however, Martin did acknowledge having few mentors from semi-academic and semi-policymaking spheres. Among them were W. Randolph Burgess and Edwin W. Kemmerer. The former was the author of *The Reserve Banks and Money Markets*, the book Martin once kept along his bed every night before he went to sleep (Martin, 1970, p. 4). The latter was giving a course on gold standard at the New School for Social Research during the time, when England went off the gold standard in September 1931. At this particular moment, when this news stroke the financial markets, both Burgess and Martin were on the floor of New York Stock Exchange. Martin wanted to learn something about the gold standard and Burgess advised him to "go and listen" Kemmerer. Later on September 14th 1970 during the public lecture, Martin described his response to the mentor's advice this way: "I did. I listened. I took notes. And I still have a record of everything Professor Kemmerer said." (ibid.).

commitment by the Federal Reserve to intervene only into the short-term government securities portion of the market, and allow other parts more freedom, with interventions "held to a strict minimum"; 3) instead of "maintaining orderly conditions" in the government securities market, the Federal Reserve would "correct disorderly conditions"; 4) price fluctuations in the market were considered as "self-correcting"; (5) the Federal Reserve would no longer act as a middleman between the Treasury and public, leaving the Treasury "free to talk" with private investors over the pricing of new securities issues, effectively "promoting a self-reliant government securities market;" 6) instead of the previous policy of "reluctant buying," Federal Reserve interventions could switch to "aggressive buying" in order to "reduce uncertainty among investors;" 7) there were considerations about reactivating the call money market for nonbank dealers who considered the conditions to be unorganized (appendix D to the Martin report was entirely on this issue); 8) allowing access to the repurchase facilities of the FOMC to nonbank dealers. The entire Report reads like a sizable concession to the private players in the financial sector.[21] It is interesting to note that Chairman Martin arranged for personal finance in 1930s alongside practices on nonbank dealers' creation of collateral-based credit to clients (Martin, Legal Agreement for Loan Secured by Interest in Royalties to be Receieved from Musical Revue "Dilly Dally", 1932).[22]

[21] It could be stated that entire Martin report was shaped by Robert H. Craft, vice president and treasurer of the Guaranty Trust Co. of New York, who was appointed as technical consultant to the FOMC's ad hoc subcommittee that prepared Martin report. Craft was given leave of absence by Guaranty Trust Co. to be totally devote himself to the work on the report. His obituary published by *The New York Times* on January 12, 2000 mentioned Craft's career details, which aside his involvement into the above mentioned report and work at different private financial institutions mentioned that his "50-year career […] began a month before the stock market crash of October 1929" (Ravojan, 2000). Hence, Craft started his career at the stock market of New York City at quite the same period of time as Chairman Martin did (Barnes, 1998).

[22] This 2-page agreement was signed on April 1st, 1932 and it was an agreement between two private persons William Martin as creditor and Percy Oakes as borrower. At the time, the former was a 25-year-old trader at the New York Stock Exchange and the latter was a producer of musical revue known as "Dilly Dally", which was to open in Atlantic City on April 3rd, 1932. The subject of the agreement was creditor provided borrower with $250, which is an equivalent of about $4,500 in today's prices, to be returned in equal installments of $50 per week on Saturday. Hence, the tenor of the agreement was five weeks and payments were due on April 6th, 13th, 20th, 27th and May 4th of 1932. In addition, the creditor was to receive one quarter of one percent of the gross revenue received from the box office receipts, which were to be computed at the conclusion of each week under agreement. The agreement had a security in the form of interest in royalties to be received from Mills Publishers Inc., which had musical rights in the music revue produced by Oakes. Hence, the credit was a short-term loan (a) with revenues stream dependent on the sales of the tickets on the musical revue, and (b) with collateral in royalties.

President of Federal Reserve Bank of New York Allan Sproul openly disagreed with the Martin Report, which likely brought about his early and reluctant departure from the Bank. He objected to such aggressive concessions to private interests, in particular with the "bills only" approach. He advocated retaining full flexibility in the hands of FOMC (Sproul, 1952), (Sproul, 1980). This debate became known as "the Washington view" versus "the New York view" by Sayers (1957, p. 143), since Martin was the Washington-based Chairman of the Fed and Sproul was based in the New York Fed. Sproul based his position on personal experience and observations of the US economy in 1930s and 1940s (Sproul, 1951, p. 298). Weintraub agreed, as he saw a weakness in the FOMC's decision to "become a follower instead a leader in the money markets" (Weintraub, 1953, p. 408) (Weintraub, 1955) (Weintraub, 1956) (Weintraub, 1960). Sayers, too, sided with "the New York view" (1957, p. 145).

To some, this period was seen as the emergence of "modern finance," while to others, like Minsky, it was a shift from managerial form of capitalism to money-manager capitalism.

A proponent of the "modern finance" school, Miller (1991) points to the role financial innovation played in economic and business advancement of the 1970s and 1980s. Mehrling (2011) uses this terminology with modern finance building on the framework of what preceded it (Moulton, 1918) and Black (1970). Miller talks about the "successfulness" and "significance" of financial innovations during those years. The successfulness of financial innovation is usually its ability to circumvent the tax structure and government regulation. Rewards are immediate: a lower tax bill. Over time, they are rewarded with deregulation as authorities realize that adaptation to financial innovation makes more sense than prohibition. Miller differentiates between what is transitory and what is permanent in determining the significance of financial innovation. He extols financial innovations that "manage not to survive but to continue to grow, sometimes very substantially, *even after their initiating force has been removed*"[23] (Miller, p. p.7). Based on his experience on both the Chicago Board of Trade and Chicago Mercantile Exchange, Miller points out that the "*most* significant"[24] financial innovation was financial futures (pp. 9, ibid.). He also recognized that "by sheer volume of business" the financial

[23] Emphasis is original.

[24] Emphasis is original.

innovation of the euro-dollar market "would be an easy winner" and ranks it second behind futures.

Miller (1991) accepts Keynes's insights on liquidity when he describes the 1920's heyday of the New York stock market as having characteristics of a commercial bank. Thanks to "great advances […] in trading technology", "it was possible for any individual to withdraw his capital from the market or return it to the market on a moment's notice" (pp. 46, ibid.). Hence, Miller not only draws parallels between an individual's account in a commercial bank with one at the stock exchange, but he also draws parallels between the functioning of these two financial units. Both aim to maintain liquidity of IOUs held by their clients. A bank provides liquidity for individual accounts by offsetting "on most days" inflow and outflow of cash deposits and cash withdrawals of its clients. Since the balance of inflows and outflows is rarely exact, the bank keeps a buffer of primary and secondary reserves. Primary reserves smooth out the flows on normal days of operation. Secondary reserves allow the bank to mobilize funds quickly if it is faced with a prolonged drain on reserves, as in a bank run.

Miller describes a similar schema for the operations of the stock market where market-makers match against their clients' buy and sell orders. According to market practice, the net balance between buy and sell orders must be covered by the market-makers. However, "every once in a while" a series of prolonged net withdrawals cause the market-makers to start unwinding their own inventories pushing prices in the direction of market sentiment. If these downward adjustments persist, they can overwhelm the market-makers ability to match orders, which results in the equivalent of a bank run. "Momentarily, at least, the market is effectively deprived of its market makers" and "orders cannot be executed or confirmed and some floor traders may not even know what they own or owe" (pp. 46-47, ibid.).

Kregel (2018, pp. 108-124)[25] discusses the evolution of the "market-based" provisions of long-term finance by US investment banks. By making capital markets more liquid, the market-makers reduce much of the price and interest rate risks for the ultimate investors who hold long-term assets. Previously, it was general public that was attracted to holding securities for the long

[25] The section of the book is paper titled "Market forms and financial performance".

term. But thanks to investment banks supporting the market with liquidity, large financial institutions can engage in active portfolio management (ibid, pp. 121-122).

Over time, the US financial system became increasingly vulnerable to risk, and regulators began looking to incorporate risk management into their rules and regs well before Global Financial Crisis of 2008-09. Insightfully, Kregel recognized that "the way maturity mismatching is imposed on financial institutions" was key in assessing to what extent the financial system is prone to instability (ibid, p. 123). His ideas later become a part of Basel III reform.

US Dollar Money Markets after Global Financial Crisis

The severity of the Global Financial Crisis of 2008-09 (GFC) brought attention to the issue of liquidity as a top concern for financial-market stability. The Bank for International Settlements issued two papers on the subject: *Principles for Sound Liquidity Risk Management and Supervision* (2008) and *Global Liquidity – Concept, Measurement, and Policy Implications* (2011). Both deal with reforming the regulatory regime for the oversight of domestic financial institutions and their international business operations. They were used as the basis of Basel III, which, unlike Basel II, addresses the issue that liquidity is "inherently fragile" (2011, p. 24). *Principles* introduced liquidity coverage ratios or LCR and the net stable funding ratio or NSFR. It acknowledges the endogenous character of liquidity provisioning (ibid, p. 4), stating that the Basel III framework and use of LCR and NSFR "aims to constrain the ability of the banking system to provide maturity transformation" expecting that it would "reduce the amplitude of boom-bust cycles in global liquidity provision" (ibid, p. 22).

Critical views of the liquidity-based regulatory changes within the Basel framework are considered in (Minsky, 1967), (Goodhart, The Regulatory Responce to the Financial Crisis, 2009) and (Carvalho, 2014). In particular, Minsky, and later Goodhart, rejected the validity of the ratio-based regulatory approach on liquidity in the financial sector. Although he thought the Basel III framework was a step in the right direction, Carvalho pointed out that the problem is "less the numbers chosen by regulators [for two liquidity ratios] than the definition of what is to be considered liquid assets for the calculation of the liquidity coverage ratio or what constitutes a stable finance source" (Carvalho, 2014, p. 361).

CHAPTER 1. EVOLUTION OF PROFIT-SEEKING TECHNIQUES IN THE NEW YORK MONEY MARKET BEFORE THE GREAT DEPRESSION

The New York Call-Money Market as Innovation

Since the early nineteenth century, the New York money market has been the linchpin of the financial structure of the US economy. Although the Philadelphia Stock Exchange is the oldest exchange in the country and the city was a pioneer in banking, both were quickly overtaken by New York as the country's main financial center. New York became, and still is, the main hub of foreign trade in the US. At the turn of the nineteenth century, the country relied heavily on manufactured goods arriving in New York from Europe and Great Britain before being shipped to final destinations throughout the US.

The New York money market initially came into prominence as a call-loan market, also known as a demand-money market and call-money market[26]. This was a market for short-term credit, where call or demand loans that were secured by actively traded stocks and bonds were extended to borrowers. The important feature of these loans was that there was an active market for them, and they were backed by collateral that was easily saleable.

The call-money market was a financial innovation of Wall Street bankers who did business on the New York Exchange. At the time, it did not have a parallel in other financial centers[27] such as in United Kingdom, France, and Germany[28]. New York dominated this market from the mid-

[26] Myers pointed out that by 1857 the call money market had become firmly entrenched in the New York money market (Myers, 1931, p. 132).

[27] Myers named it as "a peculiarly American product" and "[i]n none of the European money centers had a similar type of loan to reach such predominance" (Myers, 1931, p. 126).

[28] See appendix Table 3, on p. 40 for brief description of the differences between the US and European credit systems before the adoption of the Federal Reserve Act in 1913 in the United States.

nineteenth century through to the stock market crash of 1929. It effectively came to an end after the Great Depression[29].

The key innovation was the juncture of the securities market and the financial institutions of the time: banks, and non-banking financial institutions such as trust companies, and insurance companies, among others. During normal times, the securities-market side of this instrument provided highly liquid assets as collateral for a loan. As a function of entering into one of these instruments, the loan facilitated trading in the securities that were pledged on credit. On credit meant that a buyer of a stock or stocks that were deemed as having a "good active market" could purchase them on margin. The margin requirement before the Great Depression was a highly liberal 10%[30]. Eventually, the stock market and the call loan market fed each other in the sense that bank credit was supporting stock prices and their appreciation. The reverse was true also: stock price declines and bank credit availability were interconnected.

Various building blocks paved the way to the creation of this unique financial structure. They include, first, the nature of prevailing business credit methods in the US and, second, the financial structure of assets that could be turned into the ultimate means of payment with differing degrees of promptness. These two factors are described in more detail below in a separate subsection followed by a discussion of credit relations within the call-money market.

During the nineteenth century and through to the end of the 1920s, promissory notes became the favored credit instrument for US businesses. This general-purpose loan was also referred to as open-account borrowing or the accommodation note[31]. In Europe at the time, promissory notes were not widely used. Most domestic and foreign trade was financed with trade acceptances. The

[29] According to Sayers (1957, p. 135), "[i]t had substantially disappeared before the second war, and was officially terminated in 1946."

[30] The margin requirement is expressed as a percentage, and it represents the difference between the market value of the securities being purchased or carried (100 percent) and the maximum loan value of the collateral. Thus, if margin is 10%, the loan value is 90% of the market value of the securities. History of margin requirements in the US stock market is provided in the appendix Figure 16, p. 39.

[31] Another name of the instrument is found in (Egger & Treman, 1917, p. 5), which is "liberal cash discount".

difference between business credit methods was so striking so that an English journalist remarked (emphasis added)[32]:

> "The great and essential difference between the American and our system of banking depends upon their mode of doing business; *their rule is our exception; our rule is their exception* … They prefer accommodation paper, resting on personal security and fixed wealth, to real bills of exchange, resting on wealth in transition from merchants and manufacturers to customers."

Borrowing on the basis of a promissory or accommodation note meant that the creditor—a bank, merchant, or corporation—was lending against the personal security of the borrower or the pledged property, and not against the business transaction, which, upon its completion on determined date, meant the liquidation of the debt obligation described in the note. In Europe, trade acceptances were the preferred credit instrument, which was a business credit between two merchants where one is the seller and the other is the buyer. Hence, there are two definitions of a trade acceptance[33] as outlined below: one is from the point of view of merchant-creditor and other from the point of view of merchant-debtor.

According to R. H. Treman, Deputy Governor of Federal Reserve Bank of New York:

> "A trade acceptance is a time draft drawn by the seller of merchandise on the buyer for the purchase price of the goods and accepted by the buyer, payable on a certain date, at a certain place designated on its face." (Steiner, 1922, p. 113)

Oliver Sands, President of American National Bank, Richmond, VA, offers this description:

> "An acceptance is an acknowledgement of the receipt of goods and a promise to pay for the same at a fixed date and place." (Steiner, 1922, p. 114)

In the US, debate over commercial-credit methods accelerated after the 1907 crisis. Eventually, the perceived need for a centralized supplier of monetary reserves resulted in the adoption of the Federal Reserve Act 1913. The side that pushed for wider usage of trade acceptances in the commercial and banking businesses argued that credit that originated via trade acceptance is of higher quality than credit originated under promissory (accommodation) notes.

[32] Quoted in (Myers, 1931, p. 47).

[33] While trade acceptances were variously described, these definitions were considered the best by Steiner (1922, p. 113).

With trade acceptances, payment was expected at the completion of a commercial transaction between two commercial units, the seller/producer of the merchandise, and the buyer/retailer of the goods. The seller/producer was a creditor selling merchandize on credit, and the buyer was the debtor. The seller could convert the buyer's IOU into a trade acceptance with a bank, and receive discounted proceeds. The buyer, or debtor, settles with the bank under the terms of the trade acceptance, presumably after it sells the purchased merchandise. See Figure 1, Figure 2, and Figure 3 on pp. 96-97. Hence, the trade acceptance was perceived to be of higher quality than the promissory note due to the two or double-name structure of the credit.

In contrast, the promissory or accommodation note was a single-name credit, where credit relations between two commercial units—the producer (seller) and the retailer (buyer)—were originated in such a way that the retailer was the borrower. Hence, the promissory note did not have the endorsement of both business units, the producer (the seller and creditor) and the retailer (the buyer and debtor)**.** See Figure 4, Figure 5, and Figure 6 on pp. 97-98. Therefore, the perceived security of such a credit was considered lower than a trade acceptance. In practice, promissory notes were rarely traded, but there was a more active turnover in trade acceptances.

There was debate at that time around both methods not only in terms of the creditworthiness of the parties, but also around the liquidity of the loans made by banks against trade acceptances vs. promissory notes. Bank loans against trade acceptances were considered as "quick", "live" and more "liquid" since they were tied directly to a commercial transaction. Proponents felt that if bank credit could be restricted to productive uses then it would discourage credit over-extension. In contrast, bank loans against promissory notes were considered to be "slow", "frozen" and less "liquid" assets and also prone to credit overextension. The promissory note, as a general obligation, did not have an underlying commercial operation attached to it, which made it difficult to sell to a new creditor.

Proponents of trade acceptances in the US argued for the creation of a full-fledged monetary system along the lines of Great Britain, France, and Germany. There, not only was commercial credit predominantly based on trade acceptances, but an elastic supply of monetary reserves was available via a central bank. The argument was a central bank would increase the elasticity of the monetary supply in times of need. This institution would rediscount trade acceptances in

accordance with the European practice, and the US economy would escape from cycle of economic boom, stagnation, or even depression[34].

In their turn, proponents of promissory notes argued that established bank practices accommodated businesses' needs on a continuing basis so that working-capital financing, while ostensibly short-term, in practice turned out be medium-term. In the normal course of business, banks could be counted on to renew or extend loans when asked by their commercial clients.[35]. In fact, this could be verified in a seemingly unexpected place, the call-loan market, which by definition and general set-up was a market for loans callable on demand or on a daily basis[36].

Another strong argument against trade acceptances was formulated as rejection of the self-liquidating nature of commercial credit. A business requires the ongoing extension of credit; liquidation of an existing credit requires the creation of another one, which is, effectively, a renewal. Moreover, if a massive liquidation of commercial credit takes place then this would

[34] The most vocal proponent of the trade acceptances was Paul Warburg with his papers (Defects and Needs of Our System, 1930a), (The Discount System in Europe, 1930b), (Acceptances in Our Commerce, 1930c), (Benjamin Strong, 1930d). He was accompanied by banking industry insiders such as (Allen W. S., 1918), (Egger & Treman, 1917) as well as commercial industry insiders such as (Carman, The Change in Credit Methods Made Necessary by the Federal Reserve Act, 1915).

[35] In particular, Moulton talks about the practices among the banks where "renewals of commercial loans are very common, if not, indeed, the rule. Well-informed bankers have estimated that at least 40 or 50 per cent of unsecured loans in large cities is renewed at maturity. In fact, bankers usually grant their customers renewals whenever they ask for an extension of time—so long as there are no disquieting developments in connection with borrower's business—and with the reservation that the customer must pay off his loans entirely at least once a year." Eventually, Moulton refers to this as "as pay once a year" practice (Moulton, 1918c, p. 707).

[36] In his primer on the call-money market of 1925 Griffis argued that up to 95% of loans were effectively renewed the next day. He pointed out that there were two interest rates in the call loan market: (1) the market rate, at which new loans where extended, and (2) the renewal rate, at which the already-extended loans where renegotiated every day if the present-day renewal rate was different from the previous day's. Hence, Griffis states "[t]he result of the fact that the loans are made at the market rate for only one day is that about 95 per cent of the loans are not governed by the market rate, but a very large percentage of them follow the renewal rate." Eventually, Griffis concludes "not all call loans stand merely a day or two and then terminate; there is one example of a call loan standing for more than twelve years." (Griffis, 1925, pp. 14-15).

However, Keynes description of Wall Street operations, which due to the New York stock exchange set-up implied incorporation of the call money market, calls to mind another extreme: "[…] when Wall Street is active, at least a half of the purchases or sales of investments are entered upon with intention on the part of the speculator to reverse them *the same day*. This is true of the community exchanges also." (Keynes, The General Theory Of Employment Interest And Money, 1936, p. 160), footnote 1, emphasis is original.

bring about a recession if not a depression.[37] Within this side of the debate, the concept of "shiftability" was advanced. Moulton, its key proponent, claimed that liquidity of bank assets came about thanks to shiftability of the assets or some part of those assets from the balance sheet of one bank to the balance sheet of another (Moulton, 1918c, p. 723). In effect, shiftability meant "salability" or the ability of one bank to sell an asset to another bank[38] or to a central bank with little or no loss in value (Morton, 1939, p. 282). Admittedly, the side adhering to the shiftability view acknowledged that there could be trouble shifting some assets in times of stress.[39] It wasn't until after the stock-market crash and well into the 1930s that Keynes came up with an alternative, more nuanced, and sophisticated view of liquidity and shiftability.

The existence of the call-money market in New York, which had no parallel in other developed financial markets, was a distinctive feature of US commercial credit.[40]

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[37] This view was explicitly expounded in (Moulton, 1918c, p. 707) and in (Morton, 1939, p. 282).

[38] Or any other willing buyer like a non-banking financial institution or a non-financial business or a private individual.

[39] Moulton provides an entire section titled "Liquidity in times of crisis" in his article (Moulton, Commercial Banking and Capital Formation: III, 1918c, pp. 723-729). There he assumes that during the crisis "shiftability", or ability to dispose assets to other banks, "rests upon the ability either to draw upon unused reservoirs of reserves or to create new forms of reserve money that can be used as a basis for an expansion of loans." (ibid, p. 726)

[40] Myers stated that "[i]n none of the European money centers has a similar type of loan that reached such predominance, or has been utilized in same degree. The demand loan secured by stocks and bonds is a particularly American product […]" (Myers, 1931, p. 126).

Meeker noted that "[i]n such leading European financial centers as London, Paris, Berlin, Amsterdam, and Vienna, the security-loan markets are less effectively organized than in New York." (Meeker, 1930, p. 619).

Keynes underlined the striking feature of the New York Stock Exchange that distinguished it from its London counterpart was accessibility to an average American to invest his/her funds into the market. Naturally that kind of investment implied in the Keynes' writings that the average American was buying securities on margin with usage of call money-market arrangements. This is because Keynes along the way of this exposition talks about two things: (i) speculation, and (ii) use of credit. Eventually, Keynes implicit endorses the view that the New York securities market with its call money-market was an innovation not practiced in Europe. Keynes concludes: "[…] the sins of the London Stock Exchange are less than those of Wall Street may be due, not so much to differences in national character, as to the fact that to the average Englishman Throgmorton Street is, compared with Wall Street to the average American, inaccessible and very expensive." (Keynes, 1936, p. 159). This view corresponds to (Martin, 1932), where an accessibility of stock purchases at the New York exchange to an average American is vividly presented. To conclude on American innovative exceptionalism of the time, this line is worth to be quoted: "[Even] Keynes never found it easy to understand, let alone accept, the way the Americans managed their country." (Cristiano, Marcuzzo, & Sanfilippo, 2018, p. 18).

Over the 1910s, Earl P. Carman, a Pittsburg businessman, argued for wider use of trade acceptances (based upon the double-name credit method).Writing in 1915, he provided one of the most concise descriptions of the financial architecture of the US at that time:

> "In America […] prior to the passage of Federal Reserve Act, no means existed for re-discounting commercial paper, and it could only be converted into cash when it matured. […] it compelled American bankers to relegate commercial credits to a secondary position and *devise a means of making loans which could be converted into cash whenever desired*. Consequently, demand loans secured by collateral which could be sold in the open market became the favorite method of investing demand deposits, and clearly the most logical method under the circumstances. *This preference for collateral loans encouraged the creation of the collateral which could be pledged to secure such loans*. This collateral, however, consisting of stocks and bonds, is the product of investment banking, and represents fixed or permanent property. The loans made against it, therefore, are in no sense commercial. *The stock exchanges furnished constant market quotations for such collateral and provided means of selling it instantly should the banks desire to do so*. Naturally, under such circumstances, collateral loans could be secured with greatest ease, and this encouraged speculation on the stock exchanges." (Carman, 1915, p. 1397)[41]

Carman's observation is remarkable from at least two points of view. First, it states that the call-loan market was a money-making institution that provided convertibility of assets "into cash whenever desired." Second, securities such as stocks and bonds were created to fill a need for collateral for call loans to be secured by these financial instruments that had "constant market quotations" on the stock exchange. Carman's observations invite a number of conclusions. However, before making them, there is a need to provide a more detailed overview of the mechanics of call-loan market operations.

From the sociological viewpoint, Wall Street was providing an environment for a quicker climb up of the ladder of social status than other financial centers. There is an interesting viewpoint that humankind can be divided into three types: fantasist, slacker, and striver. It claims: "No wonder the three archetypes have tended to segregate themselves. In big cities, *strivers gravitate to financial districts*, whereas fantasists establish enclaves such as Greenwich Village in 1950s New York" (Kuper, 2012), emphasis added.

[41] Emphasis added.

Indeed, there was a set of special arrangements in the operations of the stock exchange and banks in New York City's financial district[42] as they relate to the call-loan market. They are best illustrated through describing the balance-sheet changes of the market participants.

(1) **Over-certification.** This arrangement existed between stockbrokers on one side, and banks and trust companies on the other. It allowed the stockbrokers to settle purchase and sale agreements between the sellers of stock and buyers who were using margin to make purchases rather than paying in full. In essence, over-certification works this way: if a broker was given an order from a buyer who invests on margin, and the broker found a willing seller, the broker delivered a check to the seller for the full market value of the securities. A buyer who was using margin was obliged to deliver to the broker a check equal to just 10-25% of the market value, depending on the margin requirement of the stock. The remainder was a loan from the broker to the buyer. To cover the rest of the purchase price, in turn, the broker became a borrower, and its lender was a bank or a trust company. The broker and the bank had a preexisting agreement such that if a broker had a margin buyer, it could send a check to the bank with required funds indicated on the check, and the bank would endorse or certify this check, indicating that the broker was good to deliver the funds to the seller of securities. This arrangement required that the broker had a small balance at the bank, which the bank allowed it to leverage as much as 20 times when certifying checks for securities purchases on margin.[43]

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[42] Both Pratt and Myers used same word "intimate", while broadly describing those arrangements. Thus, Pratt was talking about "the close intimacy existing between the money market and the stock market" (Pratt, 1903, p. 182). While Myers pointed out that call-loan market "has been intimately connected [via New York banks] with […] with entire banking structure of the nation" (Myers, 1931, p. 126).

[43] Pratt describes this arrangement as follows: "A broker enters into a definite arrangement with one of the banks on a basis something like this: the broker agrees to keep a daily cash balance at the bank of, say, $50,000; in return, the bank agrees to certify his checks to an amount, say, of $1,000,1000." (Pratt, 1903, p. 183). And "[t]he larger the average balance [of the broker's bank account] the larger the certification." (ibid. p. 184).

Myers referred to over-certification checks as "[o]ne of the most *vexing* questions which arose in connection with brokers' borrowings from banks […]. In order to obtain the securities which had been purchased for his customers' account, it was necessary for the broker to pay the seller by check. But in order to obtain the deposit against which to draw such a check, the broker had first to borrow from his bank. It was impossible for both operations to be performed simultaneously, and to bridge the gap, banks were accustomed to certify the broker's check, permit him to take it to the seller and bring back the securities which were to serve as collateral, and then to deposit the proceeds of the loan to meet the draft. For several hours the bank was therefore in the position of having an unsecured loan on its books. […] The practice of over-certification of checks had developed gradually with the growth of stock trading,

(2) **Re-hypothecation.** In effect, the bank was extending a short-term, unsecured loan to the broker, who was under commitment to the bank to delivery in few hours' time the securities bought on margin. These securities were held as collateral for the loan the broker obtained to accommodate its client, who bought those securities on margin. This chain of pledges of the securities bought, where the ultimate buyer[44] pledges them with the broker who in its turn pledges them with the bank, is re-hypothecation.

Both practices—over-certification and re-hypothecation—were illegal in the late nineteenth and twentieth centuries. Pratt points out that as early as 1903, the National Banking Law prohibited over-certification. However, this did not stop the practice, and it was even observed that "practically, the law is a dead letter." (Pratt, 1903, p. 183). Over-certification was an accepted practice despite being contrary to the law of the time[45]. Later, in the early 1900s, the broker/banker arrangements evolved so as to avoid a "technical violation of the National Banking Law"[46] stemming from over-certification. The new arrangement, which had "freedom from illegality"[47], was called "morning" loans. They were extended to brokers by banks at amounts that covered "their probable certification for the day." Using morning loans, intraday

and had been common for at least a quarter-century before the passage of the National Bank Act [in 1863]." (Myers, 1931, pp. 282-285), emphasis added. More, talking about the broker's leverage capacity Myers talks about the ratio of five times: "[Within this arrangement, t]he broker […] obtains from his bank an authority to issue checks; this authority is usually for an amount of five times as great as the broker's balance […]." (ibid, p. 285).

[44] Pratt describes this arrangement in the following way: "The customer is nominally the owner of 5,000 shares of stock, which he has, however, never seen, and which is actually in possession of banks whose very names he may not know. The interest of the banks in the stock represents 80 per cent of its value; the broker's, 10 per cent; and the customer's, 10 per cent. It does not follow that every transaction is exactly of these proportions of risk. The broker, in fact, may be able to obtain from the banks loans large enough to enable him, in connection with his customer's margin, to carry a transaction without the employment of much, if any, of his own capital. […] The money-lenders are, in fact, the actual holders of the securities dealt in, and they have the largest interest at stake in the maintenance of values." (Pratt, 1903, p. 182).

[45] "[T]he practice of over-certification as conducted for the benefit of stockbrokers is by no means as dangerous as it seems. The immediate cause of the Seventh National Bank failure in 1901 was, indeed, due to over-certification, but the real causes were deeper seated than that. There has been no other serious trouble caused by certifications for brokers in twenty years." (Pratt, 1903, pp. 183-184).

[46] Ibid, p. 184.

[47] Ibid, p. 184.

unsecured lending circumvented the legal side of the banking law of the time[48]. As far as re-hypothecation was concerned, there was also a sense of "illegality of the operation" although it was considered to be "the universal practice of the [Wall] Street, to which every operator in stocks tacitly agrees."[49] A legal proceeding in late nineteenth century was brought by a client against its broker for re-hypothecating the securities the client pledged with the broker.[50] The judge in that case ruled that the practice of re-hypothecation should be agreed upon by the sides, as without it there would be no business/profit opportunities to realize by either the client or its broker. In short, the judge's ruling was interpreted in plain English as: if one objects to re-hypothecation, he/she better stay away from Wall Street.[51]

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[48] Pratt explains: "These [morning] loans are based on the "single-named paper" of the broker—that is to say, his individual, unendorsed note. With such a loan, the broker has to his credit a deposit at the bank sufficient for the day's business, and technical over-certification is avoided. The practical result is the same under either system. The latter has the merit of avoiding the appearance of evil." (ibid, p. 185).

Moulton also underlines this transition: "There is a vast business of buying on margin in which stocks and bonds are used as collateral. In connection with this business, it is important to note that the brokers temporarily borrow from the banks without depositing collateral. This was once generally done through the process of over-certification, but now is done by "morning" loans—at least so far as the national banks are concerned." (Moulton, 1918b, p. 652).

Myers called these loans "day" or "clearance" loans (Myers, 1931, p. 185).

[49] See (Pratt, 1903, pp. 198-199).

[50] Both Pratt and Myers in their writings are likely referring to the same case.

Myers wrote: "A ruling of the Appellate Division of the New York Supreme Court in 1897 proclaimed this practice [of re-hypothecation] illegal, but in spite of some confusion, no actual change in methods was made. Brokers had only to get permission from their customers to use the stocks as collateral in order to legalize the practice, and the matter was adjusted by an agreement between brokers and customers." (Myers, 1931, p. 281).

Pratt explained: "The illegality of the operation [of re-hypothecation] can be avoided by an agreement between brokers and customers. The law on this subject was expounded a few years ago by Justice Williams in the Appellate Division of the New York Supreme Court. He held practically that when securities held on margin for a customer were pledged with other securities for loan for a greater amount then indebtedness of the customer on account of the purchase of the securities, and without the broker retaining in his possession other securities of a like kind and amount, that was *conversion* by the broker of the customer's property. Hence the necessity for an understanding between brokers and customers on this subject." (Pratt, 1903, pp. 198-199), emphasis added. It is worthwhile to note that word of "conversion" is used here with legal meaning, which is equivalent to "stealing" (see https://dictionary.law.com/Default.aspx?selected=346).

[51] Pratt expressed the meaning of the ruling in a quite colorful way: "If a customer will not agree to this absolute necessary use of his securities, he might as well keep out of the stock-market." (Pratt, 1903, p. 199).

Back to the above-mentioned example, which is an adaptation of the example borrowed from (Pratt, 1903, pp. 181-199) on purchasing a stock on margin (in appendix there are charts, from Figure 7 through Figure 13, and tables, Table 1 and Table 2, that describe this example step by step, see pp. 99-107):

(1) **The example** describes the operations of the purchase and sale of 5,000 shares of New York Central at the secondary market. For simplicity, interest payments on loans are not considered here. The example consists of two legs and within each leg there are six steps depicting how balance sheets of the key players are changed. The stock purchases are carried out on margin of 10% during each leg.[52] During the first leg, the market price of the stock is $162. In addition to the stock seller, there are three other players: the stockbroker, the buyer of the stock, and a bank. In the second leg, the stock price appreciates to $175, and a new stock buyer is added.

(2) **Leg #1:**

The initial balances of the four market players are presented. Assumptions are that (i) there is a stock seller whose simplified balance sheet consists of securities held on the asset side (5,000 shares times $162/share totaling to $810,000) with no debt, (ii) both the broker and buyer have demand deposits at the same bank equal to the amount required to buy the shares on margin, (iii) the bank's balance sheet holds the deposits of both the broker and buyer as its liabilities; further, its assets are held in reserves only. The buyer places an order to buy the 5,000 shares of New York Central on margin at the market price of $162/share, entering into the following agreement: the buyer will deliver margin of $81,000 to the broker and pledges the securities for a loan for the remainder, or $729,000.

a. In step #2, the broker approaches the seller of the stock, and delivers funds totaling $810,000, or the full value of 5,000 shares at the market price of $162. At this stage, the broker contacts the bank, and the bank, according to Wall Street practice, provides the broker with "over-certification" which is, effectively, a short-term, unsecured, intraday loan. The broker promises to deliver the stock

[52] This is the ratio of the down payment required from the buyer in relation to the total market value of the securities to be acquired. With the initial market price of the stock at $162/share, the buyer is required to put up $81,000 while the remaining part (which is $729,000) of the market value of US$810,000 will be a credit from the broker.

against its loan from the bank. This operation is "re-hypothecation". Since the broker now has a balance at the bank in the form of an uncollected check from the buyer of $81,000, the bank makes an intraday loan for the remaining $729,000.

b. Step #3, the broker and the buyer exchange IOUs: (i) the bank's IOU of $81,000 held by the buyer is debited against the broker's account, which is reflected on the balance sheet of the bank as well as on the balance sheets of these two market players; (ii) the buyer issues an IOU of $729,000 as its liability to be held as an asset on the broker's balance sheet, and (iii) the broker issues a short-term IOU called "securities due to the buyer" with the value of $810,000. This is held as an asset on the buyer's balance sheet, and called "securities due from the broker".
c. In step #4, which is done in parallel with step #3 and remains until the buyer's funds reach the broker's account, the broker delivers to the seller a certified check for $810,000, the full value of the stock. The seller deposits these funds in its account at bank while debiting (nullifying) "securities held" on its balance sheet. Meanwhile, the broker makes mirror accounting entries on its balance sheet reducing funds held at the bank and increasing "securities held."
d. In step #5, the broker reduces its indebtedness to bank by the $81,000 received from the buyer, effectively reducing its total debt to bank from $729,000 to $648,000.
e. Step #6, the broker assigns ownership of the securities to the buyer. The buyer records them as an asset valued at $810,000. The accounts "securities due" are cancelled out on the balance sheets of the broker and the buyer.
f. At this point, the closing balances are: (1) the broker holds the buyer's IOU of $729,000 as an asset. This asset consists of equity of $81,000 and the broker's IOU to the bank of $648,000; (2) the buyer holds an asset worth $810,000 consisting of $81,000 in equity and an $729,000 IOU to the broker; (3) the seller has $810,000 on deposit at the bank with no debt; (4) the bank's assets consist of $162,000 of reserves, and $648,000 as a loan to the broker. These entries are counterbalanced by the demand deposit of the seller, in the amount of $810,000. See Table 1 on p. 101-103.

g. Upon completion of these transactions, gross assets of all players in this transaction totaled $1.1mn at the end of leg #1. Upon completion of leg #2, the total amount was $3.2m (see left part of the Figure 10, p. 105).
Note that the balance sheets of all market players but the seller expanded (see left part of the Figure 11, p. 106). Figure 12 on p. 106 shows that this expansion came about thanks to lending: first between the broker and the stock buyer, and then between the bank and broker. It was the loans-create-deposits principle of the endogenous money theory that allowed the purchase and sale of the securities of this quite aggressive investment strategy to take place. If the buyer had been less aggressive and bought only 500 shares and not 5,000, total demand deposits on the bank's balance sheet would have been lower, and with less money available in the system, the growth momentum in the share price potentially would have been muted, and a new buyer would not step in.

(3) **Leg #2:**

a. As a first step, given the same players as above, we assume the market price of New York Central increases to $175 from $162. A second buyer enters to buy the shares from the original buyer. In this case, the new buyer has cash of $87,500 deposited at the bank, which is sufficient to buy the shares on margin at the current market price.
The original buyer has now become the seller[53] and the original seller[54] is passive. The new buyer buys the shares from the broker on margin at the current market price of $175/share. The buyer delivers the margin requirement of $87,500 to the broker, and pledges the stock as security for a loan of $787,500.

b. In step #2, the broker delivers the full purchase of $875,000 to the seller. Again, the broker approaches the bank for an "over-certification" intraday loan[55]. Again

[53] The buyer holds title to the 5,000 securities bought at leg #1; however, these securities were pledged with the broker who re-hypothecated them to the bank.

[54] It is an "old" seller in a sense that it was the seller in leg #1.

[55] Because this example is very much simplified as there is only one bank involved and hence all the non-bank market players are users of this very one bank's balance sheet. Because the bank in our example after leg #1 holds a lien on the 5,000 share bought by the broker's client, those same securities are going to be re-pledged to it under re-

the agreement between broker and the bank is that stock purchased by the buyer will be re-hypothecated with the bank as part of the margin agreement. Since the broker's balance at the bank is now zero, the bank extends an intra-day loan for $875,000, the full value of the stock.

c. During step #3, the broker and the new buyer exchange IOUs: (i) the new buyer's cash at the bank is debited for $87,500, and the same amount is credited to the broker's account, which is also reflected on the balance sheet of the bank; (ii) the new buyer issues an IOU of $787,500, a liability, which is held as an asset on the broker's balance sheet, and (iii) the broker issues a short-term IOU called "securities due to the buyer" with value of $875,000, which is held as an asset on the new buyer's balance sheet called "securities due from the broker".

d. In step #4, which is done very much in parallel with step #3 and until the "new" buyer's funds reach the broker's bank account, the broker brings to the "old" buyer (now the seller of 5,000 shares) the certified check for the full value of securities $875,000 in exchange for securities. In effect, the "old" buyer accepts the $875,000 check on the broker's account at the bank and asks the bank to credit his/her account with $875,000 of funds being debited from the broker's bank account. While the "old" buyer books funds at bank account (the balance increases by $875,000), he/she debits (nullifies) its "securities held" entry in the balance sheet by the market value of securities just sold, which is $875,000. Meanwhile the broker make a mirror accounting entries on its balance sheet with funds account at bank being reduced and "securities held" marked up both by $875,000.

e. During step #5 the broker and the "old" buyer do deleveraging of credit that was created in the leg #1. The "old" buyer buys out own IOUs (worth of $729,000) from brother by delivering bank's IOUs of the same value to the broker's bank account. Meanwhile the broker buys out own IOUs from the bank in the total value of $816,500 ($735,500 plus $81,000). The bank reduces its balance sheet by the same size of $816,500.

hypothecation during leg #2. Hence, the bank in the leg #2 is more secure than in leg #1 when it provides each time over-certification to the broker.

f. At step #6 the broker delivers the title of securities to the "new" buyer by marking down the asset entry "securities held" to zero and liquidating the liabilities entry "securities due to buyer" by $875,000. The "new" buyer liquidates assets entry "securities due from broker" while marking up another asset entry "securities held" by same value.

g. Eventually, the closing balances of the market players are these: (1) the broker holds buyer's IOUs of $787,500 as asset against $81,000 of equity and $706,500 of own IOUs to the bank; (2) the "old" buyer (turned to be the seller) has bank account of $146,000 as asset against equity of same size (no debt); (3) the "old" seller was inactive during the leg #2 and the balance sheet remain intact with funds at bank of $810,000 as asset against same size equity; (4) the "new" buyer's balance sheet is levered up by $787,500 of own IOUs to the broker plus $87,500 of equity to hold securities with market value of $875,000; (6) the bank's balance sheet has $249,500 of reserves and $706,500 of broker's IOUs as assets and these are held against bank's own IOUs (demand deposits) to the "old" seller of $810,000 and to the "old" buyer of $146,000.

h. The total gross assets of all market players increased from $3.4m at the very beginning of the leg #2 (closing balance of leg #1 of $3.2m plus $0.0875m of assets of "new" buyer plus a $0.0975m increase of the bank's assets due to "new" buyer depositing his/her funds with the bank) towards $3.6m at the end, see Figure 10 on p. 105. Stock market price appreciation (from $162 in leg #1 to $175 in leg #2) was converted into money, which is bank's IOUs, by the "old" buyer again thanks to bank loan extended to the broker, who in its turn was providing a loan to the "new" buyer. In terms of net financial assets of all market participants in this leg their size is $0.25m and they consist only of reserves held by the bank (see right-hand part of the Figure 13, p. 107).

While the two legs of purchasing stock on margin occurred in the secondary market, it is also worth noting that primary market operations—when investment bankers sell newly created

securities—relied on same intimate relations between underwriters and banks.[56] Banks actively lent to underwriters, which facilitated this very lucrative business.[57]

This extended description of the functioning of the accepted practices of the call-money market illustrates:

(1) The securities market was built on credit, where bank credit ranked above the credit of non-bank operators, such as a broker. The transactions above were based on standard and simplified accounting records, and they reveal that bank loans not only created deposits[58], they also created securities issued by the private sector.

(2) While Carman explicitly pointed out that securities listed and traded on the New York stock exchange were created in response to bankers' money-creation techniques and, in particular, for their requirement for collateral used in short-term lending, the example above and tabulated in Figure 7-Figure 13 and Table 1-Table 2 on pp. 99-107 showed that banks during the Minsky stage of financial capitalism were not only creating

[56] Moulton provides this exposition of primary market operations: "Financial houses which underwrite the sale of securities *borrow extensively from banks*. From the standpoint of the underwriters these borrowed funds are working capital. They constitute the means whereby they finance their underwriting operations and are of course not used by the underwriters in the creation of plant and equipment. From this point of view it is apparent that the business of the underwriter is closely akin to certain phases of commercial business, such as that of the traders in grain, cotton, and livestock. […] From the point of view of the uses to which the *funds borrowed by the underwriters* are eventually devoted, however, we find that they *are aiding investment operations*. In advancing funds to corporations, pending the ultimate absorption of securities, underwriters enable the corporations to begin operations more quickly than would otherwise be possible. It follows that to the extent that the underwriters borrow from commercial banks the banks are, in final analysis, advancing through this process funds for fixed capital uses." (Moulton, 1918b, pp. 651-652), emphasis added.

[57] Brandeis provides this exposition of underwriting fees charged by investment house for placement of securities at the primary market at Wall Street of the 1910s: "More recently, bankers' syndicates have, in many instances, received for floating preferred stocks of recapitalized industrial concerns, one-third of all common stock issued, besides a considerable sum in cash. And for the sale of preferred stock of well-established manufacturing concerns, cash commissions (or profits) of from 7 ½ to 10 per cent. of the cash raised are often exacted. On bonds of high-class industrial concerns, bankers' commissions (or profits) of from 5 to 10 points have been common." (Brandeis, 1914, p. 95)

[58] Which is a fundamental element of endogenous money approach as expounded in (Wray, 1991), (Wray, 1999), and (Wray, 2016).

> deposits,[59] they also created securities in the private sector. Further, deposit creation through lending to brokers facilitated clients' purchases of securities on margin and provided purchasing power that fostered price appreciation and profits to be monetized in the form of banks' IOUs.

Development of the call-money market since Federal Reserve Act of 1913 proceeded unhindered by the enactment of the Federal Reserve System. By design, the Federal Reserve was supposed to encourage banks to rely on the perceived better liquidity of paper eligible for rediscounting at the reserve banks and to discourage bankers' reliance for liquidity on call loans on the stock exchange.[60]

By 1929, the New York call-money market had reached unprecedented size.[61] Before the Great Depression, both its proponents and detractors shared the point of view that this market allowed banks and other economic units to have the most liquid assets or "*cash* […] callable at the option [of the asset's holder]."[62] (emphasis added).

Indeed, the unique financial innovation of the New York call-money market knitted together the stock market and bank-loan market. Its main function was money creation in the same sense that the endogenous money approach views the banking function.[63] There are several instances in the literature of the time calling attention to this particular function. The key feature was every player in the market—a bank, a broker, a trust company, a non-financial business, a private

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[59] This is an attempt to paraphrase Wray's definition of money creation: "In any modem capitalist economy, deposits are created as banks make loans when they purchase the IOUs issued by borrowers who wish to transfer purchasing power across time from the future to the present." (Wray, 1993, p. 544)

[60] Indeed, this development is illustrated by statement made on April 20th, 1926 by Dr. Adolph Miller, member of Federal Reserve Board, as quoted in (Meeker, 1930, p. 625): "The great open money market in the country today is the call loan market. It is more important than it ever was, and vastly more important than anyone ever thought it could become after enactment of the Federal Reserve Act." In addition, Dr. Miller admitted that above-mentioned development took place despite the fact that "[i]t was expected that call loans would lose in attractiveness, because that type of security was not admissible to rediscount at the Federal Reserve bank." (U.S. Congress, 1926-27, p. 682).

[61] Sayers states that "[t]he market for call money on the New York Stock Exchange [during the boom of 1928-29] "reached unprecedented dimensions" (Sayers, 1949, p. 35).

[62] This quote is borrowed from (Moulton, 1918c, p. 725), footnote 2.

[63] As expounded in (Wray, 2016).

investor—was ultimately looking to extract money from it. Revealing articles of the time include:

(1) William Martin Jr., future Chairman of the Board of Federal Reserve System, writing in 1932 on the New York Stock Exchange operations, points out the diversity of stock investors: "[a] chauffeur or [a] gardener" and they were unfortunate buyers of stocks on the eve of 1929 market crash, but each of them "slept soundly dreaming of the *money* he'd send his folks in dear old Ireland."[64] (emphasis added).

(2) Dr. Adolph Miller, member of Federal Reserve Board, in Congressional hearings in 1926 explained, "Anybody from the Atlantic to the Pacific, from Canada to Mexico, who puts his money into the [call money-]market today, provided the loans are properly handled, knows he can always get his *money* out whenever he wants it."[65] (emphasis added).

(3) In 1915, arguing for greater usage of trade acceptances in the US, Earl P. Carman pointed out that unlike their European counterparts, "American bankers [were] compelled […] to […] devise a means of making loans [at the stock exchange] which could be converted into *cash* whenever desired."[66] (emphasis added).

(4) Keynes, writing in 1936 in his *General Theory* on the stock market operations and paying particular attention to the American way of investing via Wall Street, pointed out, "[There is] spectacle of modern investment markets[, facilitating] purchases of investments [… and key motive is in] organizing markets wherein these assets can be easily realized for *money*." (Keynes, 1936, pp. 160-161).

Origins of Margin Investing and Trading

According to Mayers (1931), the US practice of trading on margin traced its roots to the custom of the mid-nineteenth century when subscribers in the shares of a bank were allowed to provide a down payment of a small fraction of the asked value of the shares, while the rest of the sum to be

[64] These quotes are borrowed from Martin's paper titled "The Present Agitation over Short Selling" (Martin, 1932, pp. 6-7).

[65] This quote is from (Meeker, 1930, p. 625).

[66] This quote is borrowed from (Carman, 1915, p. 1397).

invested was in newly borrowed funds or "deposit credits" from the same new bank, and the borrower provided the bank's share as security for the loan.[67]

Myers[68] borrowed these ideas from the works of William Gouge written in 1835. Gouge, in particular, used the example of bank capital subscription, which usually took place in several installments, where only the first required that the shareholders provide payment in specie. This allowed a bank to acquire plant and equipment needed to launch operations,[69] by "discount[-ing] notes and circulate[-ing] papers"[70], or in modern day parlance, buying clients' IOUs and issuing its own IOUs. Later installments in most cases did not require payment in specie. Shareholders borrowed from the bank against their shares.[71]

Hence, as Myers noted, endogenous money-creation by banks technically was an early prototype of margin investing. This practice "soon became a compliment to the call-loan system"[72] rooted in the New York stock exchange.

[67] See (Myers, 1931, pp. 127, 134).

[68] See footnote 1, ibid, p. 127.

[69] These are "desks and a counter, and to pay for engraving and painting its notes" (Gouge, 1835, p. 25)

[70] See (Gouge, 1835, pp. 24-25)

[71] Gouge provides a shortened exposition on how a bank is capitalized: "The Banks create their own capitals in the same manner they create the money they to the people." Then, he described it in the more detailed way: "Then comes the time for paying the second, third or fourth installment. The Bank makes a call on the shareholders. Some of them hypothecate their stock, that is, pledge it to the Bank, and with the means obtained from the Bank itself pay in their proportion. Others have obtained the means by discounts of accommodation notes, without any hypothecation of stock. Some few pay in real money: but they generally pay in the notes of the Bank itself, or of similar institutions. It is by this kind of hocus-pocus that Bank capitals are formed". (Gouge, 1835, p. 25)

Similar exposition of bank capitalization provided by Kregel (2018) in the chapter "The past and future of banks", p. 12-13. In particular, there is a quote from the 1943 book by Madeleine titled "Monetary and Banking Theories of Jacksonian Democracy": "[…] very little specie was ever paid in. Each institution simply created its capital in much the same way as it created the money it loaned to its patrons." (Kregel, 2018, p. 12). Then, Kregel explains that it was typical for Bank of England "to provide credit to its shareholders to meet the capital subscription". In the US, where banks usually had no income-earning capital assets, they turned to the practice where a bank was capitalizing expected future income of itself. Hence, a typical bank would start its life with acquisition of asset with expected earnings potential, which it would capitalize through the issue and sale of shares. And, if "shares were not fully paid by shareholders, the bank would create credit to fill the balance" (ibid, p. 16).

[72] Quote borrowed from (Myers, 1931, p. 134).

The Call Money-Market during the Spectacular Crash in 1929

It took some time and experience gained from the crises of 1907 and 1929[73] to consider changing the financial structure of the US. The call money-market had become an engine that created money and was at the ready to convert assets into cash, but it was inherently fragile because of the lack of counter-cyclical supply of reserves into banks. The policies of New Deal enacted during the 1930s and 1940s introduced a new stage of capitalism, which Minsky called Managerial Welfare-State Capitalism.

The insights of Keynes, another important theorist, on organized investment markets and liquidity in *General Theory* (1936, pp. 147-164) greatly enhanced pre-Great Depression thinking on the matter. Minsky dubbed his ideas the Keynesian speculative-financial paradigm.[74]

Keynes observed a natural outcome to "organized investment markets"—markets built around exchanges with active securities trading that successfully provide liquidity. And that is, over time, they tend to be dominated by "speculation" and not "enterprise."[75] Hence, those who participate in these markets for enterprise reasons, are "often so much in the minority that their behavior does not govern the market" (ibid, p. 150). Therefore, speculators dominate.

[73] As Moulton put it in his 1918 paper: "It took a long experience indeed for the New York banks2 finally to realize that *call loans possess no considerable convertibility into cash in time of crisis*. As viewed by the individual bank, call loans appeared to possess ideal liquidity, being terminable at the will of the bank and safeguarded by an ample margin of readily marketable securities. This situation, as we have seen, gives in ordinary times a large amount of flexibility to the banking system, but in time of crisis it is powerless to give any considerable relief. Usually the borrower on call cannot pay in time of crisis, and the banks therefore must attempt to sell the collateral. But when all banks are endeavoring to sell collateral and none wish to buy, the market for securities is automatically rendered stagnant. The experience of 1907 is too well known to require further statement on this point." (Moulton, 1918c, pp. 725-726), emphasis added.

[74] See (Minsky, John Maynard Keynes, 1975 [2008], p. 55)

[75] According to Keynes, speculation is "the activity of forecasting phycology of the market", while enterprise is "the activity of forecasting the prospective yield of assets over their whole life" (Keynes, 1936, p. 158).

Further, organized investment markets, such as stock exchanges provide regular (daily and even intraday[76]) revisions of investment commitments and those governed by speculation breed instability of the entire economic system.[77]

These revisions are governed by a market convention that revalues assets by incorporating "all sorts of considerations […] *over the near future*" (ibid, p. 152-153) (emphasis original), but does not take into account long-term considerations related to the prospective yield of the assets. Revaluation is based upon speculation by the ultimate investors as well as expert professionals serving them.[78] Individual investments are considered "safe" and "liquid" over the short term as long as there is no breakdown in the convention. Eventually, the whole idea of investment markets/stock exchanges is that they are organized to promote the liquidity of the investment, which is available to an individual investor, but not to the community as a whole (ibid, p. 155).

In practice, investment professionals, adhering to the conventions of a market that looks to assure liquidity for individual investors, then make investment decisions for their clients based on anticipated short-term changes in valuation So, they carry out transactions, as Keynes put it, with

[76] Keynes talks about Wall Street speculators that tend to reverse their positions "the same day" and that these types of transactions amount to half of all purchases or sales of securities. See footnote 1 (Keynes, 1936, p. 160).

Another time, Keynes points out on the intraday nature of the organized investment markets is when he proposed to answer this question: "How then are these highly significant daily, *even hourly*, revaluations of existing investments carried out in practice?" (ibid, p. 151), emphasis added.

Keynes' suggesting to consider a farmer that "could decide to remove his capital from the farming business between 10 and 11 in the morning and reconsider whether he should return to it later in the week" (ibid, 151) is an example of absurdity of the high-frequency reversals of business and investment commitments facilitated by "organized investment markets" if such reversals had practiced outside of these markets.

[77] In Keynes words: "With […] development of organized markets, a new factor of great importance has entered in, which sometimes facilitates investment but sometimes adds greatly to the instability of the system." (Keynes, 1936, pp. 150-151).

In October 1932, Keynes, who at the time was investing on Wall Street himself, commented on acute volatility at the New York stock exchange: "…the paper value of all the railway and public utilities, after having fallen to one tenth of what it had been 2 years previously, has then proceeded to double itself within 5 weeks. [This was nothing more] than a vivid illustration of the disadvantages a country's development and enterprise as a by-product of a casino." (Cristiano, Marcuzzo, & Sanfilippo, 2018, p. 23).

[78] Keynes described professional operators at the organized investment markets this way: "[t]hey are concerned, not with what an investment is really worth to a man who buys if "for keeps", but with what the market will value it at, under the influence of mass psychology, three months or a year hence." (ibid, pp. 154-155).

"zest and enjoyment" that "can be played amongst themselves" (ibid, pp. 155-156). The objective of the professional investor is "to outwit the crowd, and to pass the bad, or depreciating, half-crown to the other fellow" (ibid., p. 155). This is a recognition of the shiftability principle at play, which was championed by Moulton.[79]

Since Keynes is describing highly aggressive investment strategies that are highly leveraged, his reference to margin trading is implicit. To Keynes, socially advantageous investments were not this aggressive.[80] However, those perceived as most profitable were carried out with borrowed money ("a reason for the higher return", ibid p. 157).

Evolution of Profit-Seeking Techniques in Organized Investment Markets: Early Repurchase Agreements in the US

Keynes's views are applicable to both the Wall Street and the London stock exchange, (*General Theory*'s chapter 12),[81] in fact, all "organized investment markets," And they all used an aggressive investment style, which to Keynes meant using borrowed money. Certainly, this applied to the call-loan market.[82]

In general, the concept of purchasing power creation via a bank to sustain capital gains in each of these markets was identical, but the techniques of individual investments were a bit different.

Before the Great Depression, the dominant technique on Wall St. was margin trading that aided the call money-market. Lending was overnight with an option for a one-day extension, and, hence, the loan was secured by the very securities being purchased as investment.

In Europe, margin trading was not widely used, and, in addition, other techniques were utilized. A good description (Meeker, 1930, pp. 619-620) is as follows:

[79] While Moulton claimed that "shiftability is liquidity", Keynes response was liquidity as a maxim of orthodox finance is a fetish and, generally, anti-social (Keynes, 1936, p. 155).

[80] Being named socially advantageous.

[81] See footnote 40, p. 25, where a quote from Keynes' *General Theory* recalls Thromorton Street, which used to be the place of former stock exchange building. Modern-day stock exchange building in London is at the following address: 10 Paternoster Row, London EC4M 7LS, UK.

[82] To all organized investment markets Keynes was talking about in the *General Theory*, including Wall Street and its British counterpart of the time Thromorton Street as well as others.

> "In such leading European financial centers as London, Paris, Berlin, Amsterdam and Vienna, the security loan markets are less effectively organized than in New York. This is shown by the personal character if such loans abroad, as compared to with their *almost complete impersonality*[83] here [in the US]. Abroad, in fact, there is little collateral diversification, little or no power of substitution, no units for the loans, and no public and or open market for contracting them. Such loans are, in fact, treated merely as advances against securities. A borrowing stock broker or security dealer is accorded what amounts to a "line of credit" with maximum limit; he utilizes this credit by simply sending to the lender whatever securities he has handy. Usually security margins over the loan amounts are required, but the lender abroad is so poorly protected as compared with New York lenders that he is usually very conservative concerning the character of collateral—a factor which of course makes new industrial security flotations all the more difficult there.[84] The length of such loans is usually in accord with the prevailing local term settlement, which except in Berlin is fortnight.
>
> Normally, also, the European stock broker or dealer will finance himself from one term settlement to another by what amounts to our New York practice of borrowing and lending shares. This is done without security margins, and is therefore a prevalent source of danger to both borrowers and lenders. To protect the latter, however, such loans (called "contango loans" in England, and reports on the continent) are made in the form of an allied purchase and sale[85]. When a "bull" position, for example, is carried over, the borrower sells the security to the lender for cash and simultaneously buys it back from him for the fortnight account; similarly, a "bear" position is carried over by the borrower buying the security for cash and selling it again for the next settlement."[86].

This repo technique was used in Europe until the second half of 1920s, and eventually found its way to the US.

In the US, there were repo-like transactions as early as 1910s. In particular, the New York City loan-on-salary market, where "rates charged were excessive and the profits in the business were

[83] This impersonal feature of the call money market of New York has been stressed upon in different literature sources.

[84] This observations about European practices where poor lenders protection and difficult flotations of securities yields another confirmation to the affirmation made above that bank loans create private securities in a sense that they are placed (floated) via the primary market.

[85] In modern parlance an "allied purchase and sale" is a repurchase agreement or repo transaction.

[86] Emphasis added.

enormous,"[87] developed. In this early form of the Payday Loan, a salaried employee was advanced money against assignment of his wages. The lender conducted due diligence on the borrower with his employer.[88] In addition, the lender required the borrower to sign a bill of sale for his salary as additional security in case the borrower defaulted. It had the additional benefit to the lender in that it could avoid a usury claim since the transaction was not a loan, but the purchase and sale of salary.[89] This protected the lender, since the effective annual interest rate on these loans ranged from 277–329%, this kind of allied purchase and sale agreements (repos) were arranged to avoid risk to be declared illegal.

The same approach to avoiding the law was used in the US money market, where Federal Reserve banks would transact in governments securities and trade acceptances with non-member entities (dealers). Thus, in 1927, during Congressional hearings, New York Federal Reserve Bank Governor Strong described the use of repurchase agreements for trading in short-term government securities and trade acceptances (U.S. Congress, 1926-27, pp. 431-436):

> "[T]he dollar acceptance as a credit instrument in the world's market is dependent largely upon an open and active discount market where such acceptances can always be sold and that the ready marketability of the short-dated obligations of the United States government, that is, certificates of indebtedness and Treasury notes, depends to a large extent upon an open and active discount market where they can always be sold.
>
> The essential requirements for an open discount market for either bankers' acceptances or short dated Government securities include (1) a sufficient number of strong financial institutions and

[87] This quote is borrowed from the article "The Salary Loan Business in New York City" written by Clarence W. Wassam (Moulton, 1917, pp. 339-343).

[88] This quote clarifies this approach among the on-salary lenders: "It may appear a contradiction of terms that a man in danger of losing his position will be a better risk than one who is not in such danger, but the explanation is simple. One of the chief points which all loan companies emphasize is that the transaction will be perfectly confidential, and that the employer shall never know of the assignment. When the employee has broken the rule of the company and made the assignment of his wages, then it is that loan company threatens to notify the employee, and rather than lose a good position the employee will pay the charges demanded by the loan company. From a legal point of view this threat is of little value, but in practice it is most effective." (Moulton, 1917, p. 340).

[89] Implying that at the beginning of transaction the on-salary lending company was purchasing the client's (borrower's) salary and at the closing day of the transaction, when the client had made the final payment on the transaction, he was effectively purchasing his/her salary back.

In this regard, an insight from the *Financial Times*'s reporter Izabella Kaminska is worthwhile to mention: "Look at any financial market long enough and it starts to resemble the repo market." (Kaminska, 2011)

> houses acting as discount houses and dealers who will always buy at stable rates related to current money rates, prime bills, that is, bankers' acceptances and short-dated Government securities, which are offered for sale in that market, (2) an assured and sufficient supply of money at economic rates to enable much houses to carry on, and (3) an assured place of rediscount.
>
> Private banking firms and discount corporations already established in New York […] provide for the first of these requirements. The money market ordinarily provides a large proportion of the funds required by the discount houses at rates somewhat below the current call loan rates paid by stock exchange houses. This, in a measure, answers the second requirement. But in times of money stringency, when rates are advanced in the money market, it becomes essential to the maintenance of the discount market that discount houses have recourse to the Federal reserve banks for a portion of their current requirements for money with which to carry the bills and Government obligations which constitute their portfolio, and also enable them to buy new offerings of bills and Government obligations at times when supply of such bills and securities measurably exceeds the demand from investors. […] At such times of need, when it is impossible for the dealers to procure funds in the market either at all or at rates economically possible for them, assistance must be given to them by the Federal reserve banks by means of spot purchases of a portion of their supply of bankers' acceptances or Government securities. But they are retailers of these goods and must have them available for sale in the future, the Federal reserve banks have made arrangements [called "sales contracts"] with them so that they may repurchase such acceptances and securities at some time in the future." […] "sales contracts" […] are written undertakings on the part of such firms or corporations agreeing to purchase from the Federal reserve bank with a short period, not to exceed 15 days, the identical bills and securities which they had previously sold."

Some questioned the legality of these arrangements between non-members and the Federal Reserve Banks. The argument was that, in essence, "sales contracts" were loan operations with those entities. Governor Strong rejected these claims arguing that the Federal Reserve Act (section 4 and section 14) authorized any Federal reserve bank (a) "to make contracts" and (b) to "purchase and sell in the open market, at home and abroad, either from or to domestic or foreign banks, firms, corporations, or individuals, […] bankers' acceptances and bills of exchange of the kinds and maturities by this act made eligible for rediscount".

CHAPTER 2. EVOLUTION OF PROFIT-SEEKING TECHNIQUES IN THE NEW YORK MONEY MARKETS DURING THE NEW DEAL AND WORLD WAR II

The New Deal brought with it a number of reforms and constraints on the US financial sector such as deposit insurance, raised margin requirements, and the Glass-Steagall Act that served to reign in financial speculation.

Notable were laws governing margin requirements. It was not uncommon prior to the 1929 crash for margin to be as low as 10%. After passage of the Securities Exchange Act of 1934, the minimum margin allowed was 25%. It rose to 50% during 1936–37, and has remained at 40% since 1937. Consequently, brokers' loans collapsed to historical lows soon after these rules were enacted. This put an end to money-market activity by non-New York City banks and non-banker lenders. The New York City banks became the main lenders to the stock exchange brokers (see Figure 14 and Figure 15 on p. 108). It wasn't long before the New York call money market collapsed altogether.[90]

Not only had Wall Street had become "the whipping boy of New Deal legislation," but the standalone status of the Federal Reserve Bank of New York from the rest of the Federal Reserve system was curtailed.[91]

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[90] The Martin Report of 1952 asserted "effective call money post for dealer loans such as existed in the 1920's" implied the call money post was closed in the wake of the Great Depression and the 1929 stock market crash preceding it (Federal Open Market Committee, 1952, p. 2023).

[91] This phrase is borrowed from Charles A. Coombs—a long serving officer of the Federal Reserve Bank of New York who started his career in early 1930s and became head of Foreign Department the bank during 1959-75 before retiring—particularly from his book *The Arena of International Finance* (1976, p. 22). Coombs also wrote about the diminished position of the New York Federal Reserve bank under the New Deal: "[In 1930s] the New York Federal was […] subjected to the restrictive if not jealous supervision of governors of Federal Reserve Board in Washington, who did nothing to fill the void thus created." (ibid). "The wings of the New York Bank had been severely clipped by New Deal legislation in the early thirties. Since then, several governors of the board as well as their staff had devoted themselves to the task of keeping the Bank grounded." (idib, p. 69).

Obviously, Coombs was critical of the stance and policies of Marriner Eccles, then Chairman of the Fed, towards the Federal Reserve Bank of New York. Eccles himself provided a rationale for curtailing the influence of the New

Instead of concentrating on securities traded on the stock market, the banks and broker-dealers turned to government debt, which increased threefold in nominal terms from $15.9 billion at 1930 yearend to $57.5 billion by yearend 1941. During World War II, the increase was an even more dramatic fourfold, and government debt rose to $275.7 billion by yearend 1945 (Figure 18, p. 111).

Organization of finance in the US during World War II and the preceding period—what was effectively called as "functional finance"[92], while within the Federal Reserve it was referred to as "war finance"[93]—led to increased outstanding of government securities. Consensus early on held that the "Treasury had to borrow […] at stable, not rising, rates of interest."[94] During this period, the yield curve was fixed at three-eighths of 1% on 90-day bills, and rose to 2.5% on 20–25 year bonds.[95]

Banks, broker-dealers, and non-bank financial institutions in the New York money market that had previously based short-term financing on tradable stocks now looked to tradable government securities. This was facilitated by the Federal Reserve, which during 1942 issued a number of directives with the aim to guaranteeing the smooth functioning of the government-securities market. One important function that still exists are repos: the standing commitment to repurchase government debt of a like amount and maturity, at a given rate of discount. Later on, this change brought about a re-thinking of the Federal Reserve's influence over bank reserves:

> "[Thanks to the 1942 Federal Open Market Committee directive, the] ninety day Treasury bills in the hands of commercial banks were made the *same as cash*, the *initiative* with respect to the use of reserve funds was transferred from the Reserve Banks to the commercial banks, the

York bank due to the outsized influence of the private bankers on the legislative initiatives of the Fed before his appointment (Eccles, 1951).

[92] Thus, Karl Polanyi wrote of that time that "The removal of the control of money from the market is being accomplished in all countries in our day. Unconsciously, the creation of deposits effected this to a large extent, but the crisis of the gold standard in the twenties proved that the link between commodity money and token money had by no means been severed. Since the introduction of "functional finance" *in all important markets*, the directing of investments and the regulation of the rate of saving have become government tasks." (Polanyi, 1968 [1944], p. 252), emphasis added.

[93] Allan Sproul frequently uses this terminology in (Sproul, Changing Concepts of Central Banking, 1951).

[94] Quote borrowed from Allan Sproul (1951, p. 300).

[95] Ibid, p. 303.

> need for "excessive" excess reserves was erased, if it ever existed, and the *fluidity of funds available in all parts of the country was increased* and brought to bear directly on the Government security market." (Sproul, 1951, p. 303), emphasis added.

In time, repurchase agreements became the primary security underlying the US-dollar money markets. Below is a summary by Federal Reserve Bank of New York of changes over 1930s in this market:

> "In a very meaningful sense, however, the buying and selling of shorter-term Government securities through a specialized dealer market, and the lending apparatus that has evolved to make it possible for these dealers to carry their portfolios, provide the kind of continuous communication between all parts of the national money market that was once made possible by the call money market. The elimination of the payment of interest on demand deposit by the Banking Act of 1933 and 1935, the prohibition of member banks' acting as a medium for the placement of security loans for nonbank lenders by the Banking Act of 1933, the establishment of margin requirements for loans to purchase or carry listed securities under the terms of the Securities Exchange Act of 1934, and the easy money conditions of the later thirties, along with other changes, brought the call money market virtually to an end long before the desk was formally and officially closed at the Stock Exchange in 1946. The new arrangements grew as the old deteriorated, for the economic need continued to keep the centripetal forces of the nation's money machinery directed toward a common center, and reliance upon interbank connections alone (out the statues and regulations that emerged out of Great Depression) could not, apparently, fully satisfy the need. Also, the very large body of short-term Government debt created during World War II provided a nearly ideal instrument for the development of a new mechanism." (Roosa, 1956, p. 17)

CHAPTER 3. EVOLUTION OF US DOLLAR MONEY-MARKET PROFIT-SEEKING TECHENIQUES SINCE 1950S AND THROUGH THE GFC

The period under discussion spans from the early 1950s and through to the emergence of modern-day money-markets that have been heavily influenced by the legacy of post-GFC[96] rescue efforts by the world's major central banks.

[96] GFC – global financial crisis of 2007-08.

Using Minsky's terminology, most of this period can be defined as money-manager capitalism. While Hyman Minsky originally regarded money-manager capitalism as the period that began in the 1960-70s[97], here, I bring to light institutional changes that took place in the early 1950s that led to the outgrowth of money-manager capitalism.[98]

A Free-Market Push by Fed Chairman Martin

In the early 1950s, soon after reaching an accord between the Treasury and Federal Reserve, newly appointed Chairman of the Board of Federal Reserve System William Martin Jr. initiated a groundbreaking review of the general principles of the operations of both of the Federal Reserve Banks and private banks and broker-dealers in the government-securities market. The Martin Report was a collaboration between the Federal Reserve and private-market participants. The technical work for the report was done by Robert Craft, who took a leave of absence from the Guaranty Trust Co. to undertake this task.[99]

The Report was heavily weighted toward the concerns of the private sector, and what it wanted the Federal Reserve and Treasury to deliver for the sake of "permit[ing] a *really free market* in United States Government securities to develop without direct intervention for the purpose of establishing particular prices, yields, or patterns of yields."[100]

[97] Wray (2009, p. 814) states that "[e]conomists recognize a turning point in the early 1970s" while institutional changes took place a decade earlier at least "[t]he 1960s and 1970s saw the development of an array of financial institution liabilities circumventing New Deal constraints as finance responded to profit opportunities."

As argued by Whalen (2010), (2017), this period started in the 1980s. Whalen, in his paper (Understanding Financialization: Standing on the Shoulders of Minsky, 2017), suggests a more precise point of time "since 1982" and through to the present (ibid, p. 31).

[98] Another term for this period is a time of "modern finance". It was popularized the followers of Fischer Black (1970), Merton Miller (1991), and most recently Perry Mehrling (2011). It builds its main theoretical premise on the starting point of 1952, when Fed Chairman Martin headed an internal assessment of the participation of the Federal Reserve System in the domestic market for government securities. The Martin Report marked the inception of the "market-based credit system that [was] constructed since 1970" (Mehrling, The new Lombard Street: how the Fed became the dealer of last resort, 2011, p. 123). Mehrling connects "modern finance" not only with the Martin Report (Federal Open Market Committee, 1952), but also with an earlier work by Moulton (1918c) on "shiftability".

[99] Robert H. Craft, vice president and treasurer of the Guaranty Trust Co. of New York, who was appointed as technical consultant to the FOMC's ad hoc subcommittee, prepared the 1952 Martin Report.

[100] This quote is borrowed from (Federal Open Market Committee, 1952, p. 2015), emphasis added.

The private sector's main requirement was that there be no intervention by the government into the market except for short-dated instruments. Other concerns included the re-activation of the "highly-organized" call money market, and also the wider usage of repurchase instruments. They were in favor of allowing access to a larger circle of market participants to the Federal Reserves' repo operations, including non-qualified dealers.

Not surprisingly, private-market participants had a low opinion of the restrictions imposed by New Deal legislation:

> "In the American money market of today there is no counterpart for the *highly organized* call money market which has been a principal feature of other great money centers, past and present. There is no place at the present time where a lender can offer temporarily idle funds for loan, confident that the loan will be well secured and that the funds will be available on demand completely at his convenience and option. Conversely, there is now no place in the American money market to which a dealer in money market securities can go for loans to carry his position, confident that with suitable collateral money will always be available to him on a completely impersonal basis, repayable at his convenience at any time, and at a cost which on an average will be reasonable as compared to other money market yields. In other words, there is no truly open market for call loans or demand money in the United States at the present time."
> (Federal Open Market Committee, 1952, p. 2053), emphasis added.

> "[T]he subcommittee feels it would be worthwhile to see whether or not a call-money post could be reactivated where nonbank dealers could borrow for portfolio purposes. It is anomalous to find money-market banks maintaining over a considerable period of time a portfolio of bills that yields them a lower return than the rates at which they are willing to lend on call an equivalent collateral. Normally one would expect the opposite relationship to prevail; provided the market were truly impersonal the loan with less risk exposure should carry the lower rate. It is disturbing to find a money market so *unorganized* that dealers, to counteract this situation, cultivate both out-of-town banks and corporations individually on a customer basis as sources from which to borrow money. Revival of an effective call-money post for dealer loans such as existed in the 1920's would go far to correct this condition."
> (Federal Open Market Committee, 1952, p. 2023), emphasis added.

In fact, while in the private sector, Chairman Martin had actively utilized short-term financial instruments himself. In 1952, Martin invested his own money into short-term IOUs with a promoter of an Atlantic City musical revue. Under this agreement, Martin accepted (i) a portion of the revenue stream amounting to ¼ of 1% of gross revenues to be received from box office

receipts, and (ii) interest in royalties to be received from the revue, which served as security for the loan (see footnote 22, p. 23). This transaction could be considered a repo since the borrower sold his royalties with interest, committing to repurchase them, while paying a fee to the lender.

Here I suggest that the Federal Reserve leadership had a broad underlying bias toward reforms in the domestic financial sector that would reverse institutional changes that took place under New Deal and during World War II. Martin's leadership was underlined in his public speeches, see (Martin, The Transition to Free Markets. Remarks at Luncheon of the Economic Club of Detroit, 1953).

Despite the slight controversy that arose between Chairman Martin and Allan Sproul, President of New York Federal Reserve Bank, over the conclusions and requirements of the Martin Report, and ended with Sproul's early departure, at the time, Chairman Martin was credited with strong leadership that cemented the Fed's independence from the Treasury and Administration. He was also credited with reversing institutional changes made by former Fed Chairman Marriner Eccles, in particular, empowering the New York Fed with operational leadership in domestic and foreign financial markets, which had been curtailed by Eccles in the 1930s.[101]

Minsky on Institutional Changes in the New York Money Market

The Martin Report documented complaints from money-market participants that the market had become "so unorganized that dealers […] cultivate[d] both out-of-town banks and corporations individually on a customer basis as sources from which to borrow money".[102] However, it was Minsky's paper (Central Banking and Money Market Changes, 1957) that pointed out the evolutionary changes in the money markets, and that financial institutions themselves were part of those changes in their hunt for profits. This was especially evident in environments of "high or rising interest rates." (ibid, p. 172)

[101] Coombs wrote a one-and-a-half-page long praise of Chairman Martin leadership by saying: "Martin ran the Federal Reserve in a cheerful and relaxed way, tolerant of clashing views among his fellow governors and the 12 Reserve Banks, and he strongly supported the regional roles of the Reserve Banks against the centralist forces seeking to concentrate all authority in the Federal Reserve Board in Washington." (Coombs, 1976, pp. 69-71)

[102] Quote borrowed from (Federal Open Market Committee, 1952, p. 2023).

Minsky describes the profound change the New York money market had experienced, especially after World War II when interest rates on government debt were fixed. Afterwards, a free market regime was allowed, but given that the Federal Reserve tended to overreact to inflation concerns, interest rates were put on a rising trajectory. This, coupled with a ban on banks earning interest on demand deposits, created a climate for what Minsky called "money-market innovations" in the form of the development of non-bank financing methods. Minsky observed that as broker-dealers, more specifically bond houses, increased their participation in the repo market over the 1920s and into the 1940s, eventually non-financial firms entered the market. This shift was grounded by the stance of the Federal Reserve that its "accommodations are a privilege rather than a right" of market participants as long as they possessed "eligible paper." Over time, as Minsky commented on as early as 1956, "sales and repurchase agreements with nonfinancial corporations were a major source of funds for government bond houses" (ibid, p. 176). So, these financial instruments:

> "Although the contract between the bond house and the nonfinancial corporation is ostensibly a sale of government debt instrument with a tied repurchase agreement, in truth the transaction is a collateral loan callable both ways. The lending corporation does not earn the interest accruals on the "purchased" debt instruments, rather the corporation earns a stated contractual interest rate." (ibid)

Through the late 1950s, as broker-dealers steadily increased their use of repos, the Federal Reserve's influence on the US economy significantly increased, which lagged notice in official statistics until the1970s (see Panel C of Figure 19, p. 112).

Repos had become a major source of funds for broker-dealers during normal times. When interest rate were relatively high, they "always ha[d] lines of credit open at large commercial banks" (ibid, p. 178). It was during times of easy money that broker-dealers turned to bank loans since the structure of interest rates would allow them to make "money on the carry" (ibid).

In an insight well ahead of its time, Minsky points out, "Once nonfinancial corporations are habituated to making "loans" with government debt as collateral, the possibility exists that collateralized loans using nongovernment paper will develop." (ibid, p. 181)

Changes in the money market allowed a leveled volume of bank reserves to produce a greater expansion of finance, which resulted in "stretched liquidity" to use a term Minsky coined.

If nonfinancial corporations' preference for liquidity increases, it results in a spike in interest rates unless the central bank makes a counter move of injecting reserves into the banks. In times of "long prosperity", the decrease in liquidity compounds due to money-market innovations resulting in inherently unstable conditions so that "a slight reversal of prosperity can trigger a financial crisis." (ibid, p. 184).

The Rise of the Euro-Dollar Money Market

The rise of the euro-dollar money markets fits well into Minsky's analysis provided above. Regulatory constraints imposed on financial institutions in the US—such as Regulation Q that imposed a ceiling on interest rates paid on bank deposits, and no reserve requirements on funds borrowed abroad—coupled with a rising interest-rate environment—created fertile ground for the rise of an international money market for euro-dollars. These were IOUs denominated in US dollars on the balance sheets of financial institutions outside of US jurisdiction.[103] This resulted in innovations in the international US dollar money market and created economic units[104] that eventually required a dual "lender of last resort." On one hand, these units relied on their domestic central bank and financial system as lender of last resort in terms of allowing one-to-one conversion of their own local-currency IOUs into the local-currency IOUs from higher layer of the money hierarchy, such as reserves in the central bank, or currency or deposits in banks. On the other hand, the same units had become increasingly reliant on the lender-of-last-resort function for IOUs denominated in foreign currencies, among which the US dollar was the supreme unit of account. A US dollar lender of last resort could be a domestic central bank or the financial system in general, which, in turn, would require support from a US-dollar-lender-of-

[103] As described in (Klopstock, 1969).

For Minsky "euro-dollars" represented the "current structure of international banking. This structure is dominated by a wide network of mostly dollar-denominated bank debt. Such debt need not be of US-chartered organizations, the dollar assets a bank owns need not be the debt of a US entity, and the holder of bank debt as an asset need not be a US citizen." (Minsky, Money and the Lender of Last Resort, 1985, p. 15)

[104] These units range from private-sector banks and non-banking financial institutions and nonfinancial corporations to public sector's units such as governments and central banks.

last-resort foreign entity such as a commercial bank or investment fund, or directly from another foreign entity capable to providing US dollars.[105]

Euro-dollars come into existence when (i) a holder of US dollar demand deposits in a US bank places funds in a non-US bank, or (ii) a foreign bank uses a foreign currency to acquire US dollar demand deposits.[106] This approach of creating a euro-dollar market is based upon exogenous money. It explains the emergence of euro-dollars through the prism of the money multiplier. However, it seldom acknowledges that reserve deposits in the financial units of the euro-dollar system[107] held in the US banks are endogenous in nature.[108]

[105] This description follows Minsky, who formulated it this way: "[T]he bank that runs a dollar book must command "dollars" that are acceptable for covering dollar clearing losses. Such "dollars" are New York dollars that can be converted if necessary into Federal Reserve funds. Such New York dollars can be in the form of certificates of deposit in US banks, quickly negotiable commercial paper, or short-term Treasury securities. There is a market demand for short-term and negotiable U.S. dollar assets (or U.S. lines of credit) that depends on the volume of dollar-denominated liabilities in banks that are not US-chartered. In addition to its own New York dollar resources, a foreign bank running a dollar book has access to dollars through its central bank. For such banks, three things determine the availability of dollar refinancing by the central bank: the central bank's dollar holdings, the swap arrangements between the central bank and the Federal Reserve, and the terms on which the central bank will make US dollars available. But as the Federal Reserve's actions in the New York market determine the terms on which an offshore central bank can sell New York assets to refinance a member bank in trouble, then the Federal Reserve is the de facto lender of last resort to the international financial structure."
(Minsky, Money and the Lender of Last Resort, 1985, p. 15)

[106] This exposition is borrowed from (Klopstock, 1969, p. 72). It goes further to conclude that once foreign banks acquired US dollar demand deposits then "[they] employ [them] for placement in the market or for loans to customers." (ibid). A similar exposition of Euro-dollar demand deposits creation is in (Hewson, 1975, pp. 2-4) as well as in (Prochnow, 1970, pp. 17-22).

[107] The term "financial units of the Eurodollar system" means banks that operate outside of US jurisdiction, and, hence, are not supervised by US authorities. These banks deal with euro-dollar deposits. They also are referred to as "Eurobanks".

[108] Thus, one reads in (Meulendyke, 1975, pp. 351-352) the following (i) "Eurobanks do not correspond to the assumptions that underlie the reserve-multiplier model", and (ii) then there is a quote from John H. Makin paper "Demand and Supply Functions for Stocks of Euro-dollar Deposits: An Empirical Study" that stated "unlike the case with commercial banks in closed economies, where reserves may be taken to be exogenously deter- mined by the actions of the central bank, the reserves held by Euro-banks are *endogenously* determined as precautionary balances held by Euro-banks," (emphasis added). In (Hewson, 1975, p. 4) there is this exposition: "The US banking system operates as the clearing system for Eurodollar transactions, and it is where the Eurodollar banks hold dollar reserves against their dollar deposit liabilities. However, there is no "central bank" as such to control the supply of base money to the Euro-banking system; the "base" for Eurodollar transactions is *endogenous*." (emphasis added).

The alternative approach—the endogenous money view—attributes complete endogeneity to the euro-dollar banking units. This means that the endogenous money approach is equally applicable to Eurobanks' (i) dollar deposit liabilities, and (ii) reserve accounts, which are assets. In short, Eurobanks engage in money creation while dealing with own-liabilities denominated in US dollars in the same way they do while dealing with own-liabilities denominated in national currency. Or, in modern money[109] parlance, loans create deposits.[110] Banks accept clients' IOUs (loans) by issuing own IOUs (deposits) to be used by those very clients for clearing own debts or, generally speaking, for delivering on own monetary commitments with counterparties. This takes place within the universe of euro-dollar monetary assets and liabilities.[111]

The origins of cross-border money markets for euro-dollars is considered here as an endogenous system, which proved to be highly elastic in the run up to the GFC. From a historical policy initiative in the first years after the creation of the Federal Reserve, it was a prime goal to adopt Europe's credit practice of trade and bank acceptances in both domestic and international business. Internationally, it was the goal of the US to promote wider usage of the US dollar, and, thereby, make the New York money market the epicenter of international finance to rival the dominance of the London money market and international usage of the British pound for cross-border claims. Figure 20-Figure 21 and Table 4, pp. 114-115 provide data on volumes of US dollar acceptances. This line of thinking can be found in various sources.[112] US dollar

[109] Within this thesis, the term of "modern money" is a direct reference to the modern money theory, which is formulated in (Wray, 2016).

[110] See principle explained in more detail in (Dantas, 2016).

[111] This statement follows the discussion in (Nersisyan & Dantas, Rethinking liquidity creation: Banks, shadow banks and the elasticity of finance, 2017).

[112] These sources as described in Literature Review, pp. 4-6, include:

(i) Warburg with his pieces (1930c) and (1930d), where he explained that first dollar acceptances started to populate balance sheets of foreign banks when US took part "work [and] reconstruction" abroad after World War I (1930c, p. 634) and later pro-claimed in December 1928 "foreign central banks are the largest holders to-day of American bankers' acceptances" (1930d, p. 870).

(ii) Annual reports of the Federal Reserve Bank of New York for 1915 and 1916. Its first annual report for 1915 stated that in order to win the rivalry with London the Federal Reserve System adopted special policy that made New York the place to discount the bankers' acceptances denominated in US dollars "at a rate lower than the rate for the sterling acceptances in London" (Federal Reserve Bank of New York, 1916, p. 15). Its second

acceptances began in the 1910s, and increased rapidly in the 1920s before there was a euro-dollar money market. By the late 1950s, and indeed the entire decade of 1960s, growth in dollar acceptances compounded along with the rapid development of the euro-dollar money market. The emergence of the euro-dollar money markets in the 1950-60s could be attributed to (i) synchronized economic growth in different parts of the world after World War II based on accelerated international trade, (ii) tighter regulation of the finance industry in the US, a legacy from the 1930's response to the Great Depression and New Deal legislation, along with a push for deregulation and free markets in the early 1950s, (iii) more efficient means of communication,[113] and (iv) the ideological divide of the global economy into the West led by US, and the East led by Russia's Soviet bloc. It was a time of innovation with the newest euro-dollar money-market instruments.[114] The use of dollar acceptances subsided in late 1980s and over 1990s, and by the early 2000s, volume was negligible (see Figure 21, p. 115). This was due to a mix of factors, ranging from (i) the Federal Reserve's decision in early 1984 to "no longer accept banker's acceptances as collateral for repurchase agreements it uses in its daily open-market operations"[115], and (ii) other factors including a "shift to alternative financing vehicles, and decreased market liquidity"[116] that stemmed from the Fed's 1984 decision.

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annual report for 1916 cited evidence that dollar acceptances, which were referred to as "dollar bills", become used more widely (Federal Reserve Bank of New York, 1917, p. 13).

(iii) Roosa (1970) and (Melton & Mahr, 1981) provide explanation that wider population of US dollar denominated liabilities in non-US financial institutions during 1950-80s was due to growing trade turnover urged fast increase in the dollar acceptances usage internationally.

[113] In (Coombs, 1976, p. 2) there is this statement: "[b]y the late fifties, moreover, the *technological breakthrough* in transatlantic jet transport and telephone services had telescoped the ponderously slow official communications of earlier years" (emphasis added). It implicitly provides a suggestion that private business communications at international level were experiencing similar kind of progress.

Nearly a century earlier, in similar pattern of technological change boosted activity in the rising New York call money-market: "[…] Another aid to the growth of the daily settlements was the *introduction of telegraph*, which came into use in the eastern part of the country in 1847, and made daily settlement possible between cities which had formerly, because of their distance from New York, been required to rely upon time settlements in their security transactions." (Myers, 1931, pp. 133-134), emphasis added.

[114] In (Werner, Ryan-Collins, Greenham, & Jackson, 2012) it is argued that the Soviet Union controlled financial institutions, which were based in London and Paris, were among pioneers in euro-dollar banking.

[115] This quote is borrowed from (Stigum & Crescenzi, Stigum's Money Markets, 2007, p. 944)

[116] Ibid.

The Problem of International Liquidity in the 1960s

Thanks to the synchronized expansion of the major global economies after World War II, international trade prospered, and so did the euro-dollar money markets. At the same time, there was increasing concern that post-war monetary arrangements, most notably the Bretton Wood Agreement, would face strain and eventually break-up. A New York Fed official responsible for foreign exchange operations commented on financial market developments of the early 1960s:

> "[…] the steady expansion of the Euro-dollar market had built up huge reservoir of dollars that could suddenly flood onto the exchange markets."
> (Coombs, 1976, p. 83)

In his memoirs (Coombs, 1976), Combs recounts the continuous battles of major central banks to defend Bretton Wood commitments, such as the $35 gold-dollar parity, and parity of the exchange rates between, for example, US dollar and British pound, and the US dollar and French franc. Eventually, all were abandoned by the central banks when they could not deliver on convertibility promises.

Of particular interest are the practices of official liquidity creation employed by the major central banks. In the early 1960s, major central banks were concerned with the sustainability of Bretton Woods' arrangements, and their impact on exchange-rate commitments. Charles Coombs, head of the International Department of the New York Fed, and his counterpart at the Bank of France, Julien-Pierre Koszul, came up with the idea of bilateral swap agreements.

> "[Koszul in speaking to Coombs: …] it is very simple. We just do a swap of our currencies: we credit French francs to your account here in Paris against dollars to mine in New York. If you want to use your francs to defend the dollar in the exchange market, fine; if not, at the end of three months we reverse the transaction at the same rate, the money on both sides disappears, and everything is unchanged.
>
> […] the Federal Reserve and the Bank of France thus produced *out of thin air* on March 1, 1962, an increase of $100 million of international reserves by the simple process of a Federal Reserve payment of $50 million dollars to the Bank of France account at the New York Federal against the equivalent payment of French francs by the Bank of France to the account of the New York Federal in Paris."
> (Coombs, 1976, p. 76), emphasis added.

By mid-1962, net central bank swap agreements, or swap facilities, "mushroomed into a $20 billion dollar business linking the Federal Reserve with 14 foreign central banks and the BIS."[117] Over the 1960s and into the early 1970s, central banks' coordinated operations aimed to accommodate, if not contain, the euro-dollar money-markets by managing "orderly conditions" thereby "rechanneling such funds [which were short-term inflows from the euro-dollar market into national money-markets, and they were called "hot money"] back to the market."[118] With euro-dollars endogenously created by the operations of non-government economic units, the major central banks' reserves-creation[119] accommodated the private sector's demand for the ultimate means of payments utilized for the cross-border clearing of monetary commitments.

Money-manager capitalism and Euro-dollar money markets

From the 1980s and through to the present, money-manager capitalism evolved into a cross-border system, which is characterized by a highly extended pyramid of financial liabilities[120] or "different types of money"[121], with the US dollar playing a sizable role as the principal unit of account. The GFC period somewhat trimmed the dimensions of business activities of private financial institutions, although there was no significant breakdown of the pre-crisis financial infrastructure. Modern-day units of speculative finance continued to engage in financial layering where great emphasis is given to collateral-based finance[122] just as they did before the GFC. Since 1980s and through the GFC, "the use of collateral in financial markets rose exponentially

[117] This is borrowed from (Coombs, 1976, p. 78). Note: BIS is Bank for International Settlements located in Basel, Switzerland (www.bis.org).

[118] As described in (Coombs, 1968, p. 39). The same technique of endogenous money creation on the balance sheets of major central banks is provided in (Solomon, 1982, p. 177), albeit, the author used exogenous money language.

[119] "Reserve assets can be *created* as the result of inter-central bank loans. And, as we all know, expansion in the officially held liabilities of reserve currency countries (whether or not an official settlements deficit exists) adds to world reserves." (Martin, Toward a world central bank?, 1970, p. 22), emphasis added.

[120] This reference to the "extended pyramid of financial liabilities" is borrowed from (Nersisyan & Dantas, Rethinking liquidity creation: Banks, shadow banks and the elasticity of finance, 2017, p. 295).

[121] This term was defined in (Minsky, 1986 [2008], p. 252), and it was used by Minsky for describing the US financial system. Here, it is used in a cross-border context.

[122] This allowed some proponents of collateralized-based finance to claim: "The world of unsecured lending and uncollateralized trading clearly belongs to the past." (Singh, 2016, p. xi) And moreover, "[t]he collateral intermediation function is likely to become more important over time." (ibid, p. xv).

in the US and in other financial markets."[123] As an example, the balance sheets of broker-dealers in the US are such that liabilities are dominated by repurchase agreements, which implies collateral (see panel B and panel C of Figure 19, p. 112-113).[124] Thus:

> "As Minsky argued, if bankers put emphasis on the value of collateral rather than expected cash flows, a fragile financial system emerges because loan viability depends on expected market value of the assets pledged."
> (Nersisyan & Wray, 2010, p. 13)

Speculative finance, with loans being extended against collateral with constant market valuation, was in evidence during the boom times of the 1920s, as discussed above in "Chapter 1. Evolution of Profit-Seeking Techniques in the New York Money Market Before the Great Depression", pp. 27-52. The structure of modern-day speculative finance is considerably more complex than it was during the run-up to the Great Depression. However, an underappreciated similarity exists, and that is re-hypothecation of the securities pledged as collateral in repos, also referred to as a "re-use" of collateral. During the boom of 1920s, and even prior during 1900-1910s, widespread utilization of re-hypothecation was within a short chain of financial market players. Thus, an investor buying stock on margin pledged them to a broker-dealer, which, in turn, instantly re-used the collateral by pledging it with a bank, which provided credit financing for the margin investment. The re-hypothecation chain was between the broker-dealer and bank. A modern-day equivalent of this technique features a longer list of participants, and, hence, the re-use of collateral is more complex. Nowadays, money-manager capitalism features "daisy chains of re-hypothecation."[125] Now as well as then, re-hypothecation has been one of major components of endogenous money creation.[126]

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[123] See (Singh, 2016, p. xv).

[124] According to the Financial Accounts of the United States by the end of 4th quarter of 2018, aggregate balance sheet of broker-dealers consisted of security repurchase agreements for a 39% share in assets and for a 54% of liabilities (source: https://www.federalreserve.gov/releases/z1/20190307/z1.pdf, p. 108).

[125] This quote is borrowed from (Moe, 2018, p. 226).

[126] In the 2011 conceptualization of global liquidity, the BIS said: "It has been argued that repo contracts, which served as a major pre-crisis source of short-term financing for many financial institutions, represented an important form of *money creation*, since the collateral received in repo transactions could be *re-hypothecated*." (BIS, 2011, p. 7), emphasis added.

The complexity of collateral re-use spreads beyond national boundaries. In fact, it is its cross-border nature and by design that it embraces euro-dollar financial institutions. Thus,

> "The cross-border financial markets traditionally use "cash or cash-equivalent" collateral (ie, money or highly liquid fungible securities) in lieu of cash to settle accounts. Financial collateral does not have to be highly rate AAA/AA: as long as the securities (which can be either debt or equity) are liquid, mark-to-market and part of a legal cross-border master agreement, they can be used as "cash equivalent." However, post-Lehman, it is more difficult to pledge lower-rated collateral and at higher haircuts."
> (Singh, 2016, p. 1)

As Minsky predicted in 1957, leading up to the GFC, lower-rated securities were being used extensively as collateral. Minsky presciently pointed out that after successful experimenting with repurchase agreements, the financial industry would shift toward riskier practices by pledging non-government securities for this type of operation.[127] Exacerbating the situation, the international monetary and financial system would create "excess elasticity"[128] at the same time. According to Minsky, "the money market will always stretch liquidity to the breaking point during a boom." (ibid, p. 186).

Today, more than 10 years since the GFC, money markets are over-populated with cross-border transactions denominated in US dollars. During the 1990s, there was great concern over euro-dollars, although that concern has effectively been laid to rest. Instead, today, concern is over the tendency to disregard jurisdictional barriers between monetary systems of different sovereign states with the US dollar being used as the unit of account:

> "The global role of the US dollar is reflected in its pre-eminent role in the banking system. The dollar is the unit of account in debt contracts in that borrowers borrow in dollars and lenders lend in dollars, irrespective of whether the borrower or lender is located in the United States."
> (Shin, 2016, p. 5)

However, I want to point out that there is some confusion about euro-dollar markets being unregulated. They may be from the US point of view, but it is different matter outside of the US.

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[127] "Once nonfinancial corporations are habituated to making "loans" with government debt as collateral, the possibility exists that collateralized loans using nongovernment paper will develop." (Minsky, Central Banking and Money Market Changes, 1957, p. 181).

[128] (Moe, 2018, p. 226).

In some jurisdictions, domestic banks that run dollar balances are subject to domestic regulatory requirements. Banks are regulated in their own jurisdictions, and, in some cases, deposits are eligible for the state-insured safety net for household depositors.[129]

In effect, the international banking and finance system has established an extended pyramid of financial liabilities. By that, I'm referring to states with their own monetary systems running their own economies. From the point of view of each country, this extended pyramid could be different depending on the degree of monetary sovereignty.[130] In countries where financial institutions carry sizable liabilities denominated in US dollars or any other foreign currency, the notion "[t]he economy as a whole is only liquid as government permits"[131] is not very relevant. The government of those countries can provide foreign currency liquidity to domestic economic units when they run out of other options, [132] only if it has (i) sizable foreign-currency credits/reserves callable on demand, (ii) standing commitments to obtain sizable foreign-currency credits from foreign lenders, and (iii) domestic capacity to extract foreign-currency credits via increased sales of commodities, goods and services, as well as via greater exchange-rate fluctuations that presumably adjust down domestic demand for imports to drain foreign-currency credits, while having sustainable export capacity that provides foreign-currency credits. All three factors are necessary for a national government to meet the domestic economy's liquidity needs under adverse developments.

Increasingly, over the past several decades, the international banking and finance system has been dominated by profit-seeking motives of speculative finance businesses. This has produced a patchwork of national monetary systems where foreign-currency provision for dollar-book banks and non-banking financial institutions is inelastic. At the same time, due to inflation targeting

[129] For example, in Ukraine, the state system on guaranteeing bank deposits covers all deposits (in local as well as in foreign currencies) of the size of no more than UAH200,000 equivalent, which is an equivalent of US$7,400. All compensation to the depositors is made in the local currency independently of which currency the deposit was originally denominated (source: http://www.fg.gov.ua/en/information-for-depositors/information-on-households-deposit-guarantee-system).

[130] The term monetary sovereignty is used here in full accordance with the meaning conceptualized in (Wray, 2016).

[131] This quote is attributed to Victoria Chick, and borrowed from (Nersisyan & Dantas, 2017, p. 296).

[132] These options are established ways of accessing dollar credits in the US Federal Reserve member banks directly (via correspondent accounts) or indirectly through foreign non-US banks, which themselves have correspondent accounts with US banks, and are able to provide dollar credits.

and a high ratio of the exchange-rate pass-through effect[133], national authorities may be constraining the needs of domestic entities for foreign exchange through these policies. With an inelastic supply of foreign currency within the national economy, financial markets are subject to same heightened risk of fragility, which was the downfall of the New York call money-market described in "Chapter 1. Evolution of Profit-Seeking Techniques in the New York Money Market Before the Great Depression", pp. 27-52.

[133] A central bank having such a stance (that national currency weakening would lead to inflation acceleration) might tend to stick to a tight money policy, which, as a by-product, forces the central government to issue local-currency securities at higher interest rates or to cut expenditures to avoid issuance of bonds with increased coupon rates.

CHAPTER 4. LIQUIDITY FRAMEWORK UNDER BASEL III

This chapter examines the theoretical foundations justifying government intervention to minimize liquidity risk associated with financial institutions' operations. This intervention, currently being carried out worldwide in both developed and developing countries, is known as the Basel III, which was developed by the Basel Committee in the wake of the global financial crisis (GFC) of 2007–08.

Liquidity Framework Reworked

Since the GFC, policymakers around the globe have not only doubled down on the capitalization issue,[134] but they have also acknowledged the urgency of dealing with the ever-present liquidity risk financial institutions face.

Leaders of the 20 largest economies in the world, the G20, charged the Basel Committee's governing body, the GHOS,[135] with developing and overseeing the implementation of enhanced standards, which became known as Basel III. It was felt that ineffective economic oversight and the lack of safeguards of Basel II led to the GFC. This was brought to light when the Bank of International Settlements (BIS) discovered that large financial institutions had acute liquidity

[134] This paper focuses primarily on the liquidity framework and associated themes of liquidity risk and liquidity management. This paper accepts the widely held view that Basel II proved to be a weak regulatory framework. See (Carvalho, 2014) and (Goodhart, The Regulatory Responce to the Financial Crisis, 2009) among other sources. Charles Goodhard summed up his conclusion in this way: "The prime regulatory instrument [of Basel II: capital adequacy ratios (CARs)] failed totally […] because they are pro-cyclical in operation." (ibid, p. 6).

[135] GHOS stands for the Group of Central Bank Governors and Heads of Supervision, and interchangeably, the Group of Governors and Heads of Supervision, where central bank governors are referred to as just governors in general terms. This group represent 27 jurisdictions, according to the official website of the Bank for International Settlements, or BIS (https://www.bis.org/bcbs/organ_and_gov.htm). It is symptomatic of this set-up of the group that it explicitly elevates the authorities of the central bank to governing positions within a jurisdiction, and implicitly, downgrade authorities of the central government of a state (see https://www.bis.org/bcbs/membership.htm). Hence, this represents an approach in which a jurisdiction by a central bank is given priority over a state governed by a central government.

issues, despite meeting capital requieremnets under Basel II. The following excerpt is from the BIS report introducing a liquidity framework that would be incorporated in Basel III:

> "…[these financial institutions] did not manage their liquidity in a prudent manner. *The crisis drove home the importance of liquidity to the proper functioning of financial markets and the banking sector*. Prior to the crisis, asset markets were buoyant and funding was readily available at low cost. The rapid reversal in market conditions illustrated how quickly liquidity can evaporate, and that illiquidity can last for an extended period of time."
> (BIS, 2013, p. 7) emphasis added.

During the most acute phase of the GFC, the third quarter of 2008, (BIS, 2008) it became apparent that the liquidity issue was becoming desperate. The Basel Committee reviewed their existing Principles for liquidity risk management and supervision, which itself had been derived from their "Sound Practices" of 2000. Sound Practices, in turn, had been the result of the BIS's attempt to manage global liquidity after developing "A Framework" in response to liquidity issues in 1992. Principles was an effort of the BIS to determine a "greater understanding of the way in which international banks manage their liquidity on a global basis."

In an effort to improve on the 2000 version, the 2008 update, Principles, added to the list of guidelines previously established. The first 13 principles spelled out what a bank's management "should do," and the second four what supervisors "should do." Ultimately, these principles served as the foundation for the Basel Committee's standards introduced in 2013.

It took the GFC to bring home "the importance of liquidity." A striking addition to Basel III was the requirement that financial institutions meet a liquidity-coverage ratio (LCR) of more than 100%. This is defined as the ratio of the stock of highly-liquid assets to the estimated net "flow" of liabilities to be drawn down over next 30 days.

Late Brazilian economist Fernando Carvalho, in his contribution to (Papadimitriou, 2014) in the chapter "*Can Basel III Work When Basel II Didn't?"* affirmed that the Basel Committee "long neglected or underestimated […] liquidity risk." Carvalho also refers to Charles Goodhart's 2009 book *The Regulatory Response to the Financial Crisis,* and I quote:

> "(Goodhart 2009, p. 84) adds a touch of mystery to the question of why the Basel Committee neglected liquidity risks, 'What is not so well-known is that in the 1980s, at the same time as the Basel Committee was wrestling with capital adequacy issues, it was also attempting to

> reach agreement on liquidity risk management. For reasons that I have yet to discover, it failed.'" (Carvalho, 2014, p. 365).

Liquidity risk has been a concern of bankers since at least the nineteenth century. In an 1882 report to shareholders, the French bank, Crédit Lyonnais, addressed the liquidity risk associated with industrial lending. They pointed out the mismatch between maturities of assets—usually long-term loans made to industrial enterprises—and liabilities—predominantly short-term deposits made by the general public. The bank recognized the importance of mitigating that risk via minimizing the "exceptional" business line of lending to long-term investment projects for the sake of "ordinary" business, which was the discounting of commercial paper issued by merchants and short-term lending (Kregel & Rezende, 2018, p. 14).

This same concern over maturity mismatch was addressed by economic historian Alexander Gerschenkron in *Economic Backwardness* (Gerschenkron, 1962). He recounts the case of another French bank, Crédit Mobilier that was chartered by the Pereire brothers, who possessed a sharp entrepreneurial sense. In a reference to French writer Emil Zola, Gerschenkron admits that the Pereire brothers were inclined toward "speculative fever, corruption, and immorality." Their business methods tended to be extremely antagonistic, especially toward the bastions of old wealth of the French banking industry.

The Pereire brothers focused on financing industrial projects. Their business model, "industrial banking" and "investment banking" "built thousands of miles of railroads, drill mills, erected factories, constructed ports, pierced (sic) canals, and modernized cities." Because of its aggressive business model, Crédit Mobilier rapidly rose to prominence, but, in 1867, inevitably collapsed.

Perhaps management of Crédit Lyonnais' took a lesson from the missteps of Crédit Mobilier. Its lasting success, versus the quick demise of Crédit Mobilier, could at least partially be attributed to the recognition of the need to manage liquidity risk.

Despite numerous banking and financial crises during the mid-nineteenth through the late twentieth century, the tendency among mainstream economists has been to focus on the liability side and neglect the asset side of financial institutions. In *Financial Stability, Systems and Regulation* (2018, p. 7), there is a reference to John Clapham's history of the Bank of England. Clapham examines four banking functions: income, safety, convenience, and issue functions.

The income function relates to a bank's investments such lending and discounting. The issue function represents the bank's own liabilities held by different economic units. Recognition of this function is the most recent in the history of banking practices:

> "It is the issue function that has attracted the attention of economists, overshadowing the income function, which is largely overlooked in the analysis of the impact of banks on the economy. In simplified terms, this emphasis on the role of money as a means of payment has tended to concentrate attention on the liability side of the bank balance sheet at the expense of the asset side, which represents bank investments."
> (Kregel & Rezende, 2018, p. 7)

Over the twentieth century, both orthodox and unorthodox school of economic thought added to the improved understanding of liquidity risk and management. However, it took the economic boom of the 2000s followed by the meltdown of the GFC for financial regulators to pay proper attention to liquidity. Two orthodox economists, Berger and Bouwman, comment:

> "Our first project, started in the early summer 2004, was to test the theories of the effects of bank capital on liquidity creation. […] When we presented the paper the next May at the 2005 Federal Reserve Bank of Chicago Bank Structure and Competition conference, we were surprised that all of the attention and questions were on the liquidity creation measures, rather than on the tests of the effects of capital on liquidity creation."
> (Berger & Bouwman, 2015, p. xvii)

The magnitude of the 2007–08 crisis forced a quick re-evaluation of risk management principles. Goodhart remarked that the key lesson of the GFC is "surely that *both* sides of a bank's book have to be taken into account at the same time in order to assess its overall liquidity" (Goodhart, 2009, p. 87) (original emphasis).

Basel Committee's Take on Liquidity

As a result of its third wave of regulatory reform, Basel III, the Basel Committee introduced two liquidity standards:

(1) Liquidity Coverage Ratio[136] (LCR), and

[136] BIS executive summary on this standard is provided here: https://www.bis.org/fsi/fsisummaries/lcr.htm.

(2) Net Stable Funding Ratio[137] (NSFR).

These ratios test *both* sides of a bank's balance sheet.

Liquidity Coverage Ratio

The formula to calculate LCR is:

$$LCR = \frac{Stock\ of\ HQLA}{Total\ net\ cash\ outflows\ over\ the\ next\ 30\ calendar\ days} \geq 100\%,$$

where $HQLA$ is high-quality liquid assets. To assess risk, the BIS standard uses the key assumption that is both the size of high-quality liquid assets and the size of total net cash outflows are "in stressed conditions." In assessing a bank's adherence to the LCR standard, a bank's risk management officers as well as the banking supervisors must use appropriate judgment with regard to a financial institution's balance sheet, including off-balance sheet items.

The guidelines in the calculation of LCR (BIS, 2013) indicate which of a bank's assets can be considered legitimate to qualify for HQLA. There is a three-tiered approach to determine a bank's HGLA. The top tier, or Level 1 assets, are claims on the domestic public sector—the central government and central bank—and key international financial institutions—like the IMF and BIS—with an equivalent credit rating of the AAA to AA-.

Sub-tier "Level 2A" are claims upon similar entities that have a lower credit rating, the equivalent of A+ to A-, or private-sector corporate entities with a credit rating of at least AA-.

The financial instruments of these groups have to trade "in large, deep, and active repo or cash markets," so that their booked values are equal to the money value obtained when they are disposed of by a financial institution for liquidity purposes.

The last tier, "Level 2B," consists of claims on private-sector corporate entities with credit ratings as low as BBB, but have "large, deep, and active repo or cash markets." (BIS, 2013, pp. 19-20).

The net cash outflow metric of the liquidity coverage ratio aims to capture the size of the drain from a bank's balance sheet by its customers under a stressed-conditions scenario. Both the

[137] BIS executive summary on this standard is provided here: https://www.bis.org/fsi/fsisummaries/nsfr.htm.

numerator and the denominator of the LCR ratio are subject to a 30-calendar day evaluation. Thus, while HQLA are those assets that are readily turned into the ultimate means of payment, a central bank's reserves, via "large, deep, and active repo and cash markets" as the BIS put it, these are assets that have a remaining maturity life shorter than 30 days in order to qualify to be in the HQLA pool.

The frequency of calculation and reporting of LCR is ongoing, meaning "at least monthly, with the operational capacity to increase the frequency to weekly or even daily in stressed situations at the discretion of the supervisor" (BIS, 2013, pp. 44-45).

The standard acknowledges that it is "entirely appropriate" for financial institutions during periods of stress to "use their stock of HQLA," meaning that HQLA would decline below the required level of 100%.

Net Stable Funding Ratio

This ratio is determined by the following formula:

$$NSFR = \frac{Total\ available\ stabe\ funding\ (ASF)}{Total\ required\ stabe\ funding\ (RSF)} \geq 100\%$$

ASF is determined by the liabilities structure, and RSF from the asset structure. Both sides of the balance sheet are "calibrated" by adjusting the book value of a balance sheet item by a percentage-based factor.

The definitions and qualifications for balance-sheet items are the same as for the LCR standard; hence, NSFR is a derivative standard from LCR. The frequency of calculation and reporting of LCR is ongoing or "at least quarterly" (BIS, 2014, p. 17).

Origins of Current Regulatory Framework

The Basel Committee's report of regulatory reform begins with, "Many banks […] experienced difficulties because they did not prudently manage their liquidity." (BIS, 2013, p. 7), (BIS, 2014, p. 1). Here, the Basel Committee's indicates that the GFC was the result of poor liquidity risk management by individual banks, not the entire banking system.

Hence, the logic behind the LCR and NSFR is about imposing constraints on individual financial institutions in an effort to make the entire system safer. This is done by tying up the asset and

liability sides of the balance sheet. These liquidity standards are an upgraded version of the past reserve requirement ratio (RRR), and a more nuanced version of the full-reserve (or 100%) approach.

By introducing these standards, the Basel Committee recognizes that modern-day banking is increasingly a cross-border business, and a RRR-based liquidity control is too rudimentary because it does not take into account modern financial practices. The RRR attempts to apply constraints to the core part of the liability side of the balance sheet against the most liquid part of asset side, central bank reserves.

This approach worked well for a banking system in which claims are in the domestic currency and under the control of a sovereign state. However, modern-day financial institutions do considerable cross-border business, which includes multi-currency trading and investments. This means taking positions in foreign currencies both for their own account and that of their customers.

Over time, the liabilities structure of banks has become increasingly diverse, ranging from demand deposits of private individuals to wholesale borrowing instruments. Hence, the introduction of the LCR and NSFR to determine if any given institution can weather a financial storm. Nonetheless, even these liquidity standards fall far short of enforcing the full-reserved (100%) banking system, which was advocated in the 1930s by a group of US economists including Irving Fisher and Henry Simons (Simons, 1948 [1964], pp. 62-65).

Basel III's LCR is a modified full-coverage rule, which is limited to that part of a bank's total liabilities that are to be converted into the currency for customers. The NSFR is an addition to LCR, which aims further constrain a bank's balance sheet by an application of the inverse, full-reserved banking principle.

The full-reserved banking rule stipulates that all financial "institutions […] maintain reserves of 100 per cent in cash and deposits with the [central bank]" against their deposit liabilities (Simons, 1948 [1964], p. 62). The NSFR takes both the assets and liabilities sides of the financial institution's balance sheet as they are. The assets side is adjusted to determine size of stable funding a financial institution has to support by factors ranging from 0% to 100%, so that the most liquid assets such as coins, paper currency, central bank reserves, and central banks' IOUs with remaining maturities of less than six months are assigned a factor of 0%. The least liquid

assets, those "that are encumbered for a period of one year or more," as well as derivatives and other assets like non-performing loans, are assigned a factor of 100% (BIS, 2014, p. 11).

The liabilities side is also adjusted by factors ranging from 0-100% for tenor and counterparty risk. Regulatory capital and liabilities with remaining maturity of more than one year have a factor of 100%, while "stable non-maturity (demand) deposits and term deposits with a residual maturity of less than one year provided by retail and small business customers" have a factor of 95% and "funding of less than one year maturity provided by non-financial corporate customers," has a 50% factor (BIS, 2014, p. 10). The relationship between these factor-adjusted liabilities and assets gives the NSFR a sense of how illiquid assets of the financial institutions are covered by "funding" or liabilities that would not require conversion into a government IOU.

In its Basel III guidelines, the Basel Committee made an effort to streamline liquidity risk management. This series of releases (BIS, 1992), (BIS, 2000) and (BIS, 2008) illustrate the evolution of how banks deal with liquidity (emphasis added):

(1) "…the *transformation* of illiquid assets into more liquid ones is a key activity of banks." (BIS, 1992, p. 2);
(2) "A key activity of banks is the *creation* of liquidity." (BIS, 2000, p. 4)
(3) "The fundamental role of banks [is] in the maturity *transformation* of short-term deposits into long-term loans [. It] makes banks inherently vulnerable to liquidity risk[.]" (BIS, 2008, p. 7).

The Basel Committee's views on liquidity have evolved from "liquidity transformation" to "liquidity creation," and now back to "liquidity transformation." The current Basel III liquidity framework is based on the most recent version of *Sound Principles* (BIS, 2008), which is consistent with mainstream economic thinking.

Basel III's framework is centered on four key features (emphasis is added):

(1) Maturity transformation is a key function of the banks as they "transform" short-term liabilities—traditionally, deposits—into long-term assets—traditionally, loans;
(2) Liquidity creation is a by-product of banks' maturity transformation, which is also liquidity transformation, wherein banks "transform" illiquid assets (loans) into liquid

liabilities (deposits); ultimately, banks will provide their customers with liquidity by standing ready to provide payment or conversion into currency on demand;

(3) Diversification forces banks to engage in maturity transformation and liquidity creation; and

(4) Origination of funds, which the public is readily exchanging with banks for the sake of holding their liquid liabilities (deposits) is *not* elaborated.

Berger and Bouwman off this explanation (2015, p. 16):

> "…in a world with banks, a bank provides the financing to the steel company, and the public can simply deposit their funds at the bank. […] The reason why the bank can give the public liquid clams even though it holds illiquid clam itself has to do with diversification. In practice, the bank will not just provide one loan […], but it will have a diversified loan portfolio […]. This enables the bank to issue deposits, knowing that depositors generally access their funds at different times as well. The bank in this example has transformed something very illiquid (a large, long-term loan) into things that are very liquid (small, short-term transactions deposits), thereby creating liquidity for the public."

The authors highlight what happens when customers deposit funds in a bank. By the bank accepting funds, the authors explain, liquidity is created for the public. They are implying that funds deposited and liquidity are essentially the same thing: a bank creates liquidity using deposits. This is analogous to the savings-create-investments and banks-as-intermediaries themes, which is inherent in mainstream, orthodox economics thinking. What the authors do not address is how true creation of liquidity takes place. In this case, the funds that are available to the public are created by a bank loan provided to a business enterprise. Then, this company pays wages to employees and pays suppliers for goods and raw materials purchased, and likely it might retain some funds for current and future operations. In turn, the suppliers of the mentioned company pay wages themselves, and pay to their own suppliers of raw materials. Hence, households accumulate funds received as wages. If these households prefer to hold currency over deposits (bankers' IOUs), then banks will convert deposits (their IOUs) into cash or currency (which is government's IOUs[138]). If banks find themselves short of currency, they would turn to the interbank money market and exchange reserves at the central bank for cash or access central

[138] Here, government is assumed to represent central/federal government as well as central bank, according to the MMT methodology (Wray, 2016).

bank short-term lending that eventually provides cash currency to the banks. In this way, banks accommodate households with cash currency or liquidity.

Critique of Current Regulatory Framework

In heterodox economic thinking, the liquidity framework is more nuanced. It addresses the origination of funds with the public, and references the themes of transformation and intermediation. As Kregel explains:

> "[The] intermediation function [of the financial institutions] not only requires a matching of borrowers and lenders but also more importantly concerns the transformation of the maturity of financial assets from short term to long term, with lenders preferring short-term liquid assets and borrowers long-term more or less permanent fixed interest liabilities. […] In addition to maturity transformation, financial intermediaries are also characterized as producing liquidity through the issue of short-term liabilities against long-term assets. In this process the bank makes an illiquid asset held in the private sector more liquid, while the bank becomes less illiquid. The willingness of bankers to create liquidity by lending against a private sector asset (or against the expected income from private sector asset) depends on the "liquidity preference" of the bank. Maturity mismatching and liquidity creation are usually linked together. This is the case for banks that lend against real assets by creating demand deposits." (2018, p. 81)

This framework explicitly takes the financial institution into account when explaining liquidity creation. It is financial institutions that create new liquidity by using funds deposited by the public. See Wray (1991), (1999), and (2016). In *Lessons Ten Years after Lehman*, it is argued, following Schumpeter and Minsky's understanding of how the financial system works, that financial institutions are pursuing their innate liquidity creation (or issue[139]) function for the sake of their own profit maximization[140] (emphasis added):

> "…Minsky understood, as did Joseph Schumpeter, that banks create their profits in a different way from other business firms. There is no limit on the ability of banks to finance investment positions, because banks can "create money out of nothing." Since there is no financing

[139] This *issue* function is the key theme of the historical exposition of banking business development in (Kregel, 2018, pp. 3-78), chapter 1 "The past and future of banks."

[140] Hence, this is a slightly different exposition of incentives as shown under the orthodox approach, where financial institutions undertake maturity transformation only for loan portfolio diversification

> constraint for banks as a whole, the pursuit of profit is little constrained by rising costs (largely determined by the need to prevent deposit drain due to competition from other banks). Profit maximization for the system as a whole thus leads to maximizing loan volume. From this perspective of financial system operations, it is the role of bank regulators to put a cap on the volume: of prudential regulations meant to make the system safe, but also place constraints on banks' profitability. *Banks are thus ever led to expand into new activities and innovate new mechanisms of liquidity creation to circumvent bank regulation.*" (Kregel, Minsky's Forgotten Lessons Ten Years after Lehman, 2018, p. 2).

Minsky adds (emphasis added):

> "[L]iquidity is not an innate attribute of an asset but rather that liquidity is a time related characteristic of an ongoing, continuing economic institution. Whether a particular institution is or is not liquid over some time horizon depends not only upon its initial balance sheet but also upon what happens in its business operations and in the various markets within which it operates. *The liquidity of an institution cannot be measured by assigning universal predetermined liquidity quotients to assets and similar liquidity requirements factors to liabilities*." (Minsky, Suggestions for a Cash Flow Oriented Bank Examination, 1967) p. 1.

Hence, instead of the relatively static institution-specific definition of liquidity of the Basel Committee's *Sound Principals* and its reformed Basel III framework, Minsky's liquidity framework is a system-wide and evolving concept that is subject to change, irrespective of individual efforts by a financial institution to shore up its liquidity position (emphasis added):

> "Basic to the idea of liquidity as an attribute of an institution is the ability of the unit to fulfill its payment commitment. Any statement of a unit's liquidity, therefore depends upon estimating how its normal activities will generate both cash and payments, as well as the conditions under which it assets (including its ability to borrow as an "honorary" asset) can be transformed into cash. But how its normal activities generate cash, its needs for cash and the terms upon which assets can generate cash are all conditional upon business, economic and financial circumstances. *Any statement about the liquidity of an institution depends upon assumptions about the behavior of the economy and financial markets. As the assumptions are changed, the estimate of the liquidity of the institutions will vary.*" (Minsky, 1967, p. 2)

Charles Goodhart, widely thought of as a non-heterodox economist, offers this critique to using the static approach for liquidity-centric regulation and Basel III's standards on liquidity:

> "A problem […] is that regulatory requirements to hold more liquid assets, especially with the designation of minimum standards, are largely self-defeating, since assets with are *required* to

> be held, and cannot be run down in a crisis, are not liquid. A minimum required liquid assets ratio is an oxymoron." (Goodhart, 2009, p. 52).

Goodhart addresses the controversy over risk management of an individual bank and risk management of the entire financial system, especially when all banks in the financial system are keen on building up their most liquid assets:

> "…following some financial crisis, the safest line for the individual bank will be to cut lending and to hard liquidity, but if all banks try to do so, especially simultaneously, the result could be devastating." (pp. 35-36, ibid.).

And finally, there is broad support, ranging from Hayek (1937) to Goodhart (2009) and Minsky, for the view that given certain restraints on banking for expansion and pursuit of profits, financiers are motivated to create innovative measures to get around erected barriers. Ultimately, there is risk, as Goodhart (2009, p. 35) puts it, of "greater disintermediation to less control channels." Hayek (1937, p. 82) addresses the problem of enforcing full-reserve banking by questioning, "whether by abolishing the deposit banking as we know it we would effectively prevent the principle on which it rests from manifesting itself in other forms."

This begs the question of whether Basel III's regulatory standards will spawn a new wave of financial innovation in which liquidity and money creation are facilitated by other unregulated units of the economy, domestic or foreign.

There is another consideration that puts liquidity standards in a critical light. This relates to the fact that the LCR standard fits well into today's environment of the supremacy of monetary policy over fiscal policy. This introduces the following considerations regarding the LCR framework, and how it may serve to amplify financial fragility, which I examine below.

Push to relegate domestic-currency public debt

High-quality assets are defined as low risk, low duration liabilities of the government and central bank. By default, it is assumed that high-quality liquid assets are in the domestic currency. Depending on the jurisdiction, HQLA have their own distinctions based on arrangements made by both monetary and fiscal policies when public-sector liabilities are assumed by the private sector.

Given the modern-day dominance of monetary over fiscal policy, the short-end of the domestic risk-free yield curve is dominated by the central bank's liabilities, while the rest of the curve (if it

exists at all) is in central government liabilities. Moreover, government policy could be focused on restricting the size of state budget deficits[141], resulting in a declining amount of public debt.

In general, the authorities' desire for "sound finance" and, hence, a lower public debt level may create an arrangement between monetary and fiscal policy such that it is the central bank that issues short-term interest-paying liabilities as a substitute for excess reserves the banks have with the central bank. These securities have limited circulation, as only banks can buy them. Over time, such paper could be treated as separate from public debt, and, therefore, would not negatively affect the public debt level since it is issued by the central bank.

In this way, authorities create competing instruments, in which shorter-maturity notes of the central bank are preferable to longer-term central government bonds. Instruments issued by the central bank bear less risk of value loss if interest rates inch up, versus those of the central government.

Moreover, competition between interest-paying instruments of the central bank and central government—where both, in principle, are created to substitute zero-interest-paying reserves held by banks at the central bank—may result in a shortage of demand for central government bonds from the financial sector. Such a shortage (created by greater money-ness of the central bank's short-term interest-paying liabilities[142]) may put additional pressure on fiscal policy. This could be enforced by the means of continued surpluses of the government sector versus the private sector in order to keep the required balance of funds on the central government's account with the central bank. This can be achieved by a deliberate policy of restrained government expenditures.

All of the above actions will serve as built-in constraints on the amount of government bonds issued in the local currency, which are used as HQLA by the financial sector. Monetary policy have precedence over fiscal policy may contribute to crisis-prone tendencies if the government

[141] Primary state budget balance equals to revenues minus primary expenditures. Hence, primary expenditures net of budget expenditure on public debt servicing (interest payments).

[142] Shorter duration of the financial instruments reduces the risk of price decline if interest rates in the financial market increase.

faces a shortage of funds on its account at the central bank and is forced to borrow in foreign currency domestically or abroad.

The central bank's incentive to push the government into taking such action could be targeting inflation, management of the exchange rate, and building up official foreign-exchange reserves. Over time, the domestic economy will become more vulnerable to financial crisis echoing Minsky's "stability is destabilizing".

Alternative sources of assets

The LCR standard allows some jurisdictions to consider an alternative liquidity approach (ALA) when there is an insufficient supply of Level 1 assets in the domestic currency. In the case of a true shortage of relevant assets, (cash, currency, central bank reserves, central government bonds as well as central bank bonds), substitution is allowed. There are two options: first, the central bank provides reserves under contractual committed liquidity facilities, which are separate from standing facilities and whose instruments have maturities of more than 30 days; second, a bank may attract HQLA in foreign currencies that are more freely and reliably convertible.

In the case of local-currency HGLA shortages, private financial institutions may prefer to turn to foreign currencies instead of using the central bank's special facilities, especially 1) when there is a stigma attached to borrowing from the central bank; and 2) if foreign-currency instruments are cheaper. This situation may even be encouraged by the monetary authorities if, in a bid for financial stability, the central bank decides to avoid increasing banks' reserves for fear of weakening the domestic currency.

All in all, the ALA option embedded in LCR extends existing monetary fiscal policy arrangements when erosion of monetary sovereignty via progressive internalization of domestic finance takes place. A reversal of this trend, which is greater domestication of finance and re-gained monetary sovereignty, could make LCR a better concept.

Conclusion

Basel III liquidity standards, while aiming to fix or, as Kregel (2014) put it, "prevent the occurrence of crises that have already occurred," leaves a window open for financial

innovation.[143] It is interesting to note the differences between technical innovation and financial innovation. Many economists feel that modern-day technological innovations have become sublimated by innovations in finance:

> "The system was transformed from one in which productivity gains produced the income to validate debt to one in which [financial] innovation increased liquidity sufficiently to drive up asset prices to generate capital-gains income. But while productivity gains are self-validating in an expanding economy, increasing liquidity to produce capital gains eventually falters on the inevitable disappointment set up by overconfident expectations. And the system becomes more fragile and more crisis prone." (Kregel, 2018, p. 3)

The point is that technical innovation is usually associated with a certain entrepreneur and/or business unit. An innovator in pursuit of profits effectively restricts new methods of production to within the perimeter of one economic unit, e.g., a private firm. This localization of innovation is achieved through the state-run patent system. Hence, for much of the recent past, while technical innovation has stayed within that unit, competitors attempt to catch up by building a better mousetrap.

To be successful, an innovator of financial instruments requires immediate demand from the market. By design, financial innovation locks in at least two balance sheets of different economic units aiming for profit, which illuminates the striking difference between these two types of innovations. That is why new products of financial innovation, if they turn out to be faulty, cause more damage than products of technical innovation[144].

Indeed, financial innovations are likely to evolve further despite the best efforts of the regulators. In *The Regulatory Response to the Financial Crisis*, Goodhart offers this insight:

> "Even if Mother Teresa, the Archbishop of Canterbury, and the Pope were to warn against a certain line of bank activities, it would do no good; indeed, probably the reverse because immoral actions are usually short-term fun and profitable." (Goodhart, 2009, p. 30)

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[143] Here, it is worth mentioning that Kregel (2018, pp. 93-94, 116-123) provides a detailed discussion of the LCR- and NSFR-like principles employed by German banking regulators in the postwar period. In general, this solution resembles today's approach incorporated in the Basel III framework. Since German banks, as well as others, fell victim to the GFC, it would be prudent to exercise caution before replicating these efforts.

[144] This does not relate to products of technical innovation that have a military purpose of mass destruction, which are supremely destructive and transmissible by design.

CHAPTER 5. GLOBAL LIQUIDITY THROUGH THE LENS OF MONEY HIERARCHY, LIQUIDITY PREFERENCE, AND ENDOGENOUS MONEY

BIS View of Global Liquidity

The (BIS, 2011) views global liquidity as having two components: official and private.

(1) **Official liquidity** is "the funding that is unconditionally available to settle claims through monetary authorities" (ibid, p. 1). Global liquidity is created by central banks through foreign-exchange reserves and swap lines between the various central banks. IMF programs and SDRs are considered tools of liquidity mobilization, not liquidity creation. National central banks create liquidity in their national currency via normal operations. They obtain access to foreign-currency liquidity via accumulated foreign-currency reserves or swap lines with other central banks.

(2) **Private liquidity** "is created to a large degree through cross-border operations of banks and other financial institutions." "The creation and destruction of private liquidity is closely related to leveraging and deleveraging by private institutions" (ibid); it has strong cyclicality. Private cross-border liquidity is available by means of (i) securities markets, and (ii) inter-bank lending. Private liquidity creation and destruction takes place endogenously between residents of "different jurisdictions and/or in different currencies" (ibid, p. 4).

(3) Official and private liquidity interacts with each other "both in times of crisis and in more normal times" (ibid, p. 10).

Global Liquidity via the Hierarchy of Money

The BIS view implicitly accepts money hierarchy and endogenous money theories in its definitions of liquidity, two concepts that are central to the neo-Chartalist school of economic thought[145] that have grown into modern money theory (MMT), which, until the GFC, have been

[145] Discussed in (Wray, 2000) and (Goodhart, 1998).

neglected by mainstream economic thinking. The BIS views the hierarchy of money as a relatively flat structure with only two layers in the hierarchy: official and private creators of money. The BIS's references to bank and non-bank financial institutions in its definition of the private component is somewhat similar to the neo-Chartalist (or MMT) school of thought. The BIS's description of the official component limits money-creation powers to the central bank, which is where it goes wrong, in my opinion, because it omits reference to the central/federal government. This is the essence of the hierarchy of money, which is a key premise of the neo-Chartalist (or MMT) school of thought.

Local-Currency Hierarchy of Money

Consider that the top layer of the local-currency hierarchy of money consists not only of the liabilities of the central bank, but also of the federal government. This is key to neo-Chartalism thinking. Thus, the federal government, through net deficit spending, increases bank deposits as well as bank reserves, adding to the ability of private-sector units to fulfill their commitments as they come due. In this case, the federal government is both a direct creator and a provider of liquidity. The private sector, both domestic and foreign, engages in liquidity swaps, using higher-yielding federal government IOUs vs. current liquidity operations of the government, which is net deficit spending. Interest-bearing IOUs of the federal government provide regular credits to accountholders, in addition to serving as collateral for repurchase agreements between the central bank and financial institutions. Hence, creation of federal government IOUs serves as an essential element of local-currency liquidity for the financial system. There is a multi-faceted interplay between the federal government and central bank in supplying reserves to the banking system. In the modern-day economy, the sequence of events that creates and depletes reserves consists of budget expenditures of the federal government first, and taxation second.

The central bank influences bank and non-bank units' liquidly (i) when it makes an outright purchase of financial assets held by these units, and/or (ii) when it provisions reserves to banks and deposits to non-bank units via short-term sale and repurchase agreements. In both cases, IOUs of the federal government are the preferred financial instrument. Of necessity, these IOUs have to be "out there" for the central bank to manage liquidity.

In its definition of liquidity, the BIS does not address the role of the federal government in creating local-currency liquidity.

Foreign-Currency Hierarchy of Money

Here, too, the BIS fails to take into account the federal government's role in provisioning foreign exchange for the domestic economy. It limits foreign-currency liquidity to what is provided via an IMF program or swap agreements between central banks.

Indeed, national central banks routinely accumulate foreign-currency reserves when the liquidity preference of banks and the general public is on the decline. However, this development is usually a reflection of broader economic policy, which is driven by the federal government. When central banks accumulate FX reserves, likely it's because the policymakers have instituted a pegged or heavily managed exchange rate regime, and it falls to the government to sustain it. Policymakers' decisions could be driven by (i) the mercantilist approach, which is about maintaining the competitiveness of the exchange rate and preventing the currency from real[146] appreciation to protect exports, (ii) fear that a floating exchange rate might result in outsized changes in the FX rate, or (iii) because maintaining the nominal[147] stability of the market exchange rate versus a foreign currency, usually the US dollar, is perceived as the best policy choice, despite obvious defects such as limited room for policy changes, and proven vulnerability to destabilizing the economy.

National central banks accumulate foreign-currency reserves during periods of increased liquidity preferences, as well, thanks to the federal government's heavy involvement in (i) assuring availability of funds from WFI such as the IMF, and/or (ii) assuring the government's ability to borrow in foreign currency abroad.

When banks and the general public have a strong need for liquidity, there is increased demand for IOUs at the top tier of the money hierarchy in both local and foreign currencies. This induces monetary authorities to increase foreign currency credits available with the central bank or in federal government accounts.

[146] "Real" is in terms of the real effective exchange rate of the national currency.

[147] "Nominal" is in terms of the market exchange rate, implying that the real effective exchange rate of the national currency is fluctuating as long as foreign currencies fluctuate and there is difference between domestic inflation and inflation in foreign countries.

Today, for emerging-market countries, IMF programs are one of the major sources of foreign-currency. Agreements are entered into by both the central/federal government and the central bank such that it is the federal government that guarantees the repayment of the foreign-currency credits provided to the central bank. This is also the case in Eurobond markets; the central/federal government is usually the borrower of record in support of the domestic monetary system.

The BIS's concept of global liquidity, which is part of the foundation for the Basel III liquidity framework, does not take into account the role of central/federal governments, which, in my opinion, exacerbates the risk of cyclicality to the entire framework.

These two concepts—which are at the core of Neo-Chartalism, and, hence, MMT—of monetary sovereignty and sectoral balances—are essential in differentiating liquidity provisioning in local and foreign currencies. These days, penetration of liabilities denominated in foreign-currency on the balance sheets of major economic units in all economies is significant, whether they be in the private or public sector, or even the central government of a country. Of course, liabilities of one economic unit are the assets of another, and they are validated by cash flows between the units. Considering Minsky's three financing positions—hedge, speculative, and Ponzi—there will be diverse compositions of those positions within an economy. Depending on the state of the economy, one or another of these positions will dominate.

Clearly, the federal-government sector is much more capable of running sustained deficits, and, hence, it is in the best position to provide the private sector with local-currency liquidity. The more monetary-sovereign a federal government is, the greater its ability to provide local-currency liquidity, and vice versa.

Foreign-currency liquidity is a different story. To obtain foreign currency, the above-referenced government must first acquire the IOU of a foreign entity. If both currencies float, this makes the job easy because it implies flexible convertibility of local-currency money-hierarchy components with those of the foreign currency. It's more complicated in the case of a pegged, or near-pegged regime. In those countries, the central bank, via domestic interest rates, plays an active role in managing the local currency in relation to foreign currencies to ensure some reciprocity between top-tier local-currency IOUs and those of the foreign currency, usually the US dollar. High

domestic interest rates encourage foreign entities to take positions in local-currency instruments, using their foreign-currency IOUs in exchange for local-currency IOUs.

The more rigid the exchange rate policy, the more constraints there will be on net deficit spending by the central/federal government in all currencies, which, in turn, will result in increased cyclicality of liquidity. In times of prosperity, a pegged currency regime encourages official FX reserve accumulation, and expansion of foreign-currency liabilities of the private sector on the back of interest rate arbitrage opportunities on debt. An increase of FX reserves held by the central bank, coupled with a high interest rate policy, incents the private sector to leverage its balance sheets with foreign currency. To the extent this occurs, the federal government loses monetary sovereignty.

The more flexible the exchange-rate policy, especially if the government sector does not have foreign-currency debt, the more policy space the government has, and the more sovereignty it has over monetary policy. Domestic liquidity is more elastic, even if the private sector runs foreign-currency liabilities in the course of international business.

Of course, the fiscal stance of the major global economies is an important factor in global liquidity from a sectoral-balances point of view. As the government sector accommodates demand for financial assets from the private sector, or as its fiscal policy shifts, then foreign-currency assets are created or destroyed in favor of not only the domestic private sector, but foreigners as well, as the availability of foreign-currency credits expands or contracts.

View on Global Liquidity via Liquidity Preference and Endogenous Money

The BIS misses another point in its description of global liquidity. It doesn't take into account changes in liquidity preferences, and how they affect asset prices (Kregel, 1988), (Wray, 1991a) and (Wray, 1992). Mainstream economic thought, which is epitomized in the BIS regulatory framework, takes asset-price changes into account when examining collateral-based financing between the national central banks and financial institutions. It is implicitly embracing all forms of cross-border and domestic creation and destruction of financial assets. By long and established tradition, it does not distinguish nuances between local and foreign currencies as units of account for financial assets and liabilities. Since the GFC, it has embraced the generalized notion of global liquidity, which still incorporates all the shortcomings just mentioned.

What follows is the analysis of the money system as it experiences changes in liquidity preference. This analysis is borrowed from papers by Wray, which discuss a major economy like US. I attempt to build upon it, and argue its applicability towards so-called emerging market economies, where the hierarchy of money is complicated by local and foreign currency that was discussed in the previous section.

> "The liquidity ratio may be defined as the ratio of money to total assets held. Liquidity preference can then be related to the preference for a high liquidity ratio. […] When the preferred liquidity ratio rises, agents attempt to increase monetary receipts and to reduce monetary expenditures. Unless the actual quantity of money is increased, the only way that agents in the aggregate can achieve higher liquidity ratios is by decreasing the value of accumulated nonmonetary assets. Quantities of nonmonetary assets can be reduced by reducing production below the level that would be required to replace those assets destroyed through consumption. Alternatively, the value of nonmonetary assets can be reduced by a fall of their price. In summary, a rise in the preferred liquidity ratio is likely to lead to falling prices of nonmonetary assets and to falling levels of production of those assets.
>
> On the other hand, a general fall of liquidity preference will be associated with attempts to reduce liquidity ratios. Monetary expenditures will rise as agents attempt to reduce money hoards. Of cause, every monetary expenditures leads to a money receipt so that aggregate hoards cannot be reduced in this manner. Instead, the value of nonmonetary assets must rise until desired liquidity ratios are reached. This is accomplished by a combination of increased production and increased prices of these assets.
>
> A rise of liquidity preference need not generate changes in the value of nonmonetary assets if the quantity of money is increased sufficiently to increase liquidity ratios. For example, if some institution were to stand ready to buy illiquid assets in sufficient quantity by issuing liquid liabilities, the demand for liquidity could be met. However, no private institution is likely to do this, for it would require that the preferences of the institution move in opposite direction from those of general public. For example, the liquidity preference of banks is unlikely to fall just as the rest of the public attempts to increase hoards. The quantity of privately issued money would rise only if banks bucked the trend and bought all the illiquid assets the public was trying to sell. "
> (Wray, Boulding's Balloons: A Contribution to Monetary Theory, 1991a, pp. 5-6)
>
> "If liquidity preference falls, bank wiliness to lend rises at the time that firms become more willing to borrow. […] as interest rates fall, the quantity of non-bank liabilities and money issued rises. […] Thus, a change of liquidity preference affects both the quantity and price of

> money and other assets."
> (Wray, Alternative theories of the rate of interest, 1992, p. 86)
>
> "A rise in liquidity preference will lower the price of assets and raise the interest rate."
> (Wray, Boulding's Balloons: A Contribution to Monetary Theory, 1991a, p. 14)
>
> "A decline in preferred liquidity ratios will affect spending, prices, and the quantity of money. However, an asymmetry exists with regard to rising liquidity preference: attempts to reduce spending and increase hoards may cause prices and income to fall, but are not likely to increase the money stock. Therefore, an increase in the desired liquidity ratios must lead to deflation until the value of non-money assets falls sufficiently that the actual quantity of hoards stands in the desired relation to total assets. However, deflation can generate a crisis as each agent tries to sell assets and avoid purchases. The monetary authorities must enter to supply helicopter money to meet the demand for liquidity that cannot be met privately. In Boulding's analysis, primary responsibility for supplying money must fall on the Treasury, which must increase the money supply through deficit spending, rather than on the central bank-which can only affect the liquidity of bank balance sheets directly, and the money stock only very indirectly."
> (Wray, Boulding's Balloons: A Contribution to Monetary Theory, 1991a, pp. 17-18)

This description of how liquidity preference influences asset prices best describes a major economy like the US, where most assets and liabilities are denominated in local currency. In an economy where the private sector is actively engaged in international finance, the public sector is forced to follow suit, and economic units will have balance sheets dominated by foreign-currency liabilities. In such an economy, a hierarchy of money will evolve such that it provides some degree of convertibility of local-currency IOUs into those of foreign currencies. The degree of convertibility will depend on the FX regime adopted by the authorities: rigid, flexible, or somewhere in-between.

In these economies, a change in liquidity preference, or a change in the preferred liquidity ratio, can result in a wave of non-bank businesses and the general public looking to rebalance their balance sheets first in foreign currencies and then in local currency.

In these economies, the central bank controls some volume of the foreign-currency reserves, which was the product of past policy initiatives, based on either: 1) mercantilist policy of sustaining a foreign-trade surplus, which required FX purchases by the central bank from the market, to avoid outsized nominal appreciation of the national currency, or 2) a tight money

policy of maintaining high policy rate by the central bank, in order to attract foreign portfolio investments into domestic financial assets. The government sector maintains foreign-currency reserves of certain size. Especially when it is achieved via higher local-currency rates over foreign-currency, the private sector is encouraged to leverage itself up in the foreign currency, and, hence, "stretch liquidity." As a result, the central bank's FX reserves that are held against different categories of IOUs are overstretched most of the time.

For a country with a rigid monetary regime such as a pegged or managed FX rate, an upward change in liquidity preferences forces the central bank to provide two conversions almost simultaneously: local-currency, lower-tired IOUs are exchanged for top-tier, local-currency reserves, and then those local-currency reserves have to be converted into higher-tired IOUs in the foreign currency. This tends to weaken or even heavily devalue the local currency. Eventually, this bumps up against the central bank's own liquidity preference, which could be in the form a floor FX reserves it holds, or the minimum ratio of between FX reserves to government FX debt. When this point is reached, authorities are forced to allow market forces to find their own level for the exchange rate, which result in a sizable devaluation of the local currency. Inevitably, interest rates will rise, and asset prices will fall. This is why emerging-market economies that are dependent on the US dollar for international trade experience deep and prolonged recessions. The central banks in these economies are not strong enough to counteract sudden changes in liquidity preferences of the private sector.

The Basel III liquidity framework, which is based on the above mentioned concepts of global liquidity, misses both of these two factors: (1) the hierarchy of money and the government sector's role in it, and (2) liquidity preference. Basel III reflects the view that private markets are major suppliers of liquidity. The official sector is represented by a central bank only, which is the "bankers' bank not the government's bank."[148] Its recommendations revolve around preserving a system that has been managing international banking and finance for the past several decades. This system neglects the stabilizing role of the government sector.

[148] A paper by Mehrling (Elasticity and Discipline in the Global Swap Network, 2015, p. 6) adheres to this framework. Mehrling's definition of central bank function as "bankers' bank" is conceptually different to Minsky's "[Federal Reserve Banks as] bankers to bankers." The former attribute it to the increased role of central banks as market dealers to the banks, the latter relates it to the idea that central banks should be peer reviewers of banks' credit standards. (Minsky, Money and the Lender of Last Resort, 1985, p. 18)

CONCLUSION AND POLICY RECOMMENDATIONS

International finance relies heavily on US-dollar-centric money markets, wherein the market for euro-dollars assures a continuous supply of global liquidity. However, this limits the ability of national governments to influence liquidity through monetary policy in their own jurisdictions. At the end of the day, they have to confront what Minsky described as speculative finance and the build-up of Ponzi-type positions. They have limited ability to obtain foreign currency to settle past debts, which frequently have been incurred by the domestic private sector.

This calls into question whether all domestic foreign-currency IOUs should be made "current," because by doing so, local-currency IOUs would be threatened by efforts to sustain what are really unstable finance positions. Simmons's comment below raises this concern, which in 1947 was due to extensions of financial liabilities serving as money substitutes within the US economy. His comment is still well-taken in the relation to today's wide cross-border proliferation of euro-dollars:

> "Probably no one would seriously defend the proposition that all *things* should be made liquid." (Simmons, 1947, p. 310), emphasis added.

Given the above analysis, I have the following policy recommendations:

(1) The global liquidity framework, whether defined by BIS or by national authorities, should take into account that the government sector, broadly defined as the federal government and the central bank, has a crucial role in stabilizing the economy, and protecting its private sector from boom and busts. Restoration of monetary sovereignty is key.[149] Hence:

[149] Ideally, this move could come about as a result of coordinated efforts by a debtor nation with its major creditors. However, international cooperation with respect to any one country's indebtedness has been difficult to achieve since the various players tend to have different agendas. "There is little historical evidence that policy coordination is in any way beneficial to the stability of the international system" (Kregel & Rezende, 2018, p. 235). As ever the distant is the idea that "in the matter of granting loans it is not only the debtor who should be held responsible, but the creditor should be deemed to share the responsibility for the security and liquidity of the loans" (Schacht, 1955, p. 286). A more realistic approach is unilateral domestic policy that strives to maintain monetary sovereignty.

(2) Enact into law a prohibition on foreign-currency indebtedness by federal and regional governments[150] directly, indirectly, or through guarantees.[151] This could be phased in through a commitment to negative net issuance of the existing stock of FX debt. When the existing stock of FX debt runs off, the relaxation of these prohibitions could be achieved if the government issues FX debt only with an accompanying standing order, whereby the creditor supplies its own IOUs of the same unit of denomination in favor of the debtor to cancel out the borrower's outstanding IOUs with the lender.[152] This proposal warrants further research.

(3) In order to strengthen monetary sovereignty, monetary policy should adhere to one rule: overnight interest rates should be zero[153]. This supports an economy that is based upon local-currency finance, which is prevented from building Ponzis on the balance sheet of the central/federal government.

(4) When a federal government has full-fledged monetary sovereignty, it can avoid the Ponzis that arise in its own balance sheet due to foreign-currency debt issuance of the state Treasury. However, there remains a place for the policy prescriptions defined by Minsky, which are Big Government and Big Bank. Big Government ensures that profits exist in the

[150] This follows Wray's recommendation "f" from (Wray, Response to Doug Henwood's Trolling in Jacobin, 2019), which states: "[I]ssuing debt in a foreign currency is a bad choice for any country that can issue its own currency. I'd go even further and argue that any country with its own currency should *prohibit its government from issuing debt in a foreign currency, or from guaranteeing any such debt issued by its domestic firms.* However, if private entities want to issue debt in foreign currencies, I do not necessarily advocate preventing that. What about the special case of a country that issues a currency that cannot be exchanged in forex markets […]? I think it is most likely a mistake to issue debt in a foreign currency unless there is an identified source of the forex that will be needed to service the debt (for example, dedicated forex earned from exports). If you cannot exchange your currency in forex markets, and cannot earn forex, your best bet is international charity. *Indebtedness in foreign currency will be a disaster.*" (emphasis added).

[151] This implies, too, to contingent liabilities like state coverage of bank deposits, which might imply foreign-currency deposits, too. Ukraine's state-run bank deposit guarantee is such an example.

[152] This follows Roosa bond issuance practices by US Treasury during 1960s (Coombs, The Arena of Inrenational Finance, 1976, pp. 88-89).

[153] This proposal is based on Wray's work, "Given these considerations, as well as the arguments advanced by Keynes, a monetary policy rule is preferred: set the overnight rate at zero, and keep it there." (Wray, 2007, p. 138).

See, also, point (ii) in the footnote 112 on p. 58 advocating interest rates in the local currency set at a lower level than interest rates in the foreign currency.

economy via deficit spending, and Big Bank ensures asset prices in the economy via the lender-of-last-resort function.

> "Central banks, deposit insurance organizations, and treasuries have a responsibilities to assure that the banking and financial system functions in a normal way. For this to happen, there cannot be a *precipitous drop in asset values*. This implies that central banks and depository insurance organizations must assure the refinancing of specified organizations and markets." (Minsky, 1986, p. 8), emphasis added.

> "As long as government is big and the Federal Reserve is a responsible lender of last resort, the disasters inherent in an accumulating capitalist economy are likely to be avoided." (Minsky, Money and the Lender of Last Resort, 1985, p. 18).

(5) Lender-of-last-resort operations of the central bank should shift from collateral-based, open-market operations toward operations of "peer reviewer of credit standards" of the banks. In the US, this done via the discount window:

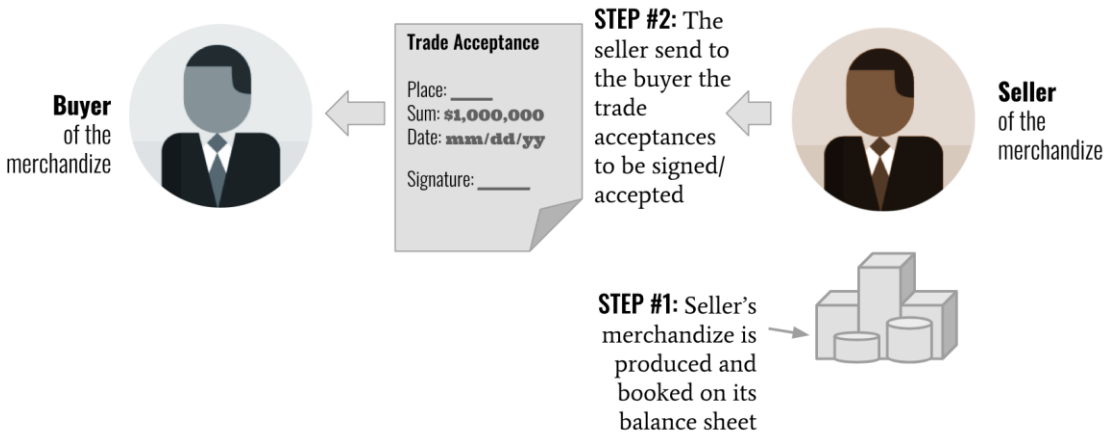
> "Bankers accept that their credit standards can be subject to peer review when they market parts of the lines they initiate. (The Penn Square case is an example of the failure of peer review during a euphoric boom.) If commercial banks normally borrowed from the Federal Reserve, if the discount window were the normal source of a large percentage of banks' ability to lend, then the regional Reserve banks would really be bankers to banks—with all the rights to structure and supervise credits that are normal to banking.
> Thus one way in which an efficient banking system can be brought into being—a system in which the ability of banks to force the Federal Reserve's hand by means of periodic threats of failure is attenuated—is to make the relation between the bank and the Federal Reserve a normal banking relation. This implies a shift away from open-market-operations central banking and a return to the discount-window central banking that guided the system over its first decades."
> (Minsky, Money and the Lender of Last Resort, 1985, p. 18).

These policy recommendations invite future research into mechanisms to escape the inherent instability not only within national economies, but also within the cross-border outreach of international banking and finance. Despite the introduction of the Basel III liquidity framework, which aims to sustain the established system of cross-border financial integration via US dollar centric money-markets, the international provisioning of non-domestic currency is not counter-cyclical; it remains pro-cyclical. Recent experience of countries like Argentina and Turkey proves that the international, US-dollar-based money market has regional spots of heightened

fragility where the local money market mimics the highly volatile New York call money market that seized up in the approach to the Great Depression.

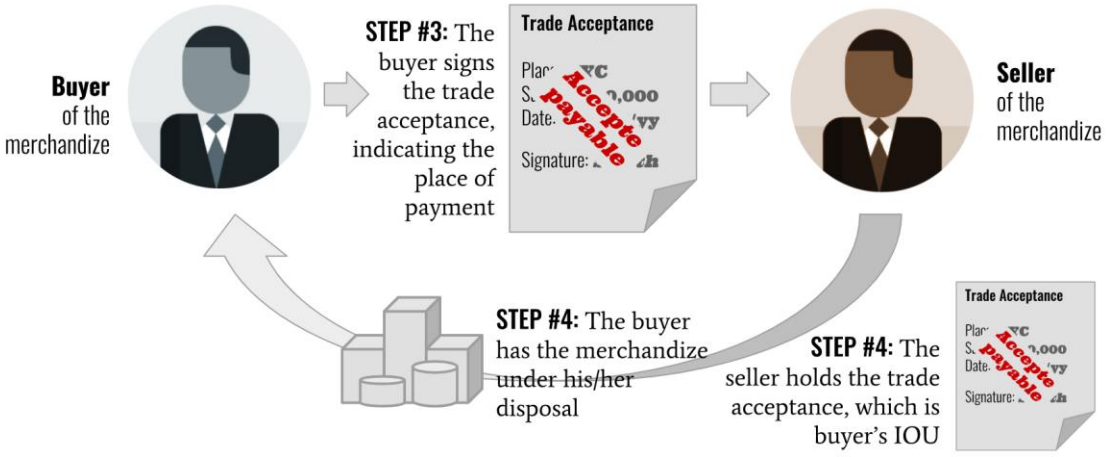
APPENDIX

Figure 1. Credit relations schema under trade acceptance[1] (steps #1 & #2)



Note: [1] adaptation from (Warburg, 1930a), (Steiner, 1922), (Egger & Treman, 1917).

Figure 2. Credit relations schema under trade acceptance[1] (steps #3 & #4)

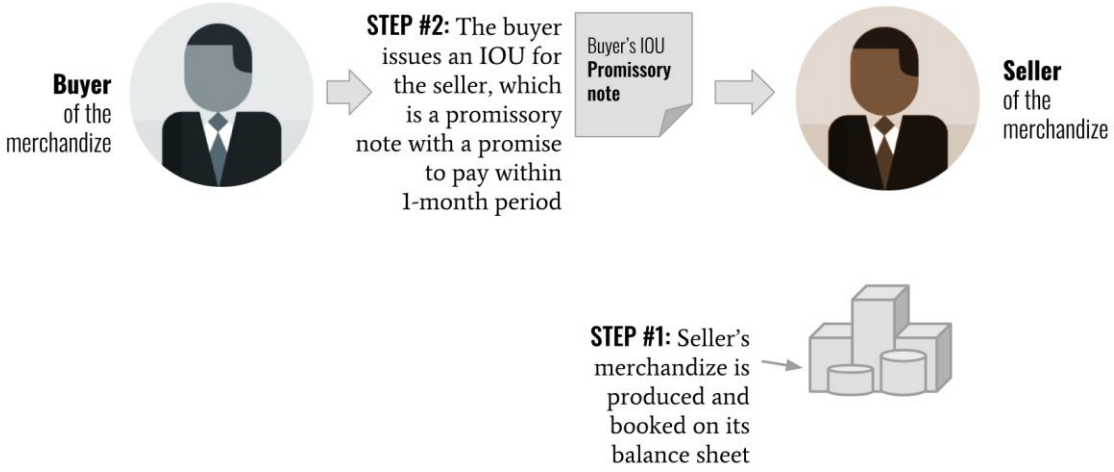


Note: [1] adaptation from (Warburg, 1930a), (Steiner, 1922), (Egger & Treman, 1917).

Figure 3. Credit relations schema under trade acceptance[1] (steps #5 & #6)

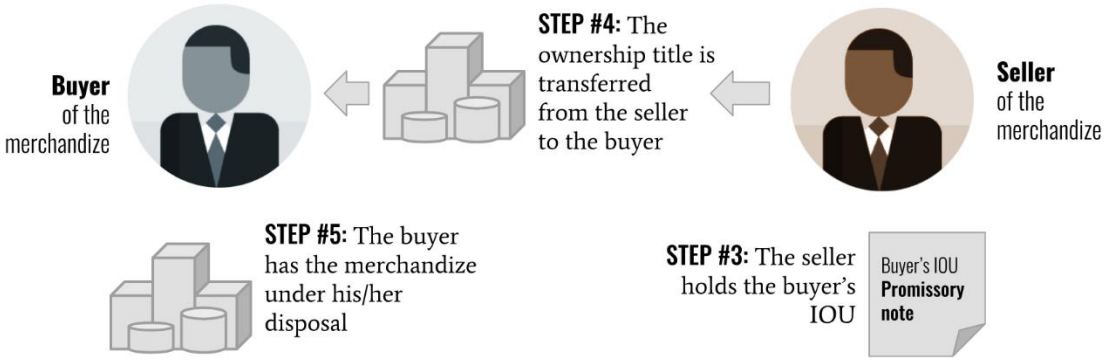
Note: [1] adaptation from (Warburg, 1930a), (Steiner, 1922), (Egger & Treman, 1917).

Figure 4. Credit relations schema under promissory (accommodation) note[1] (steps #1 & #2)



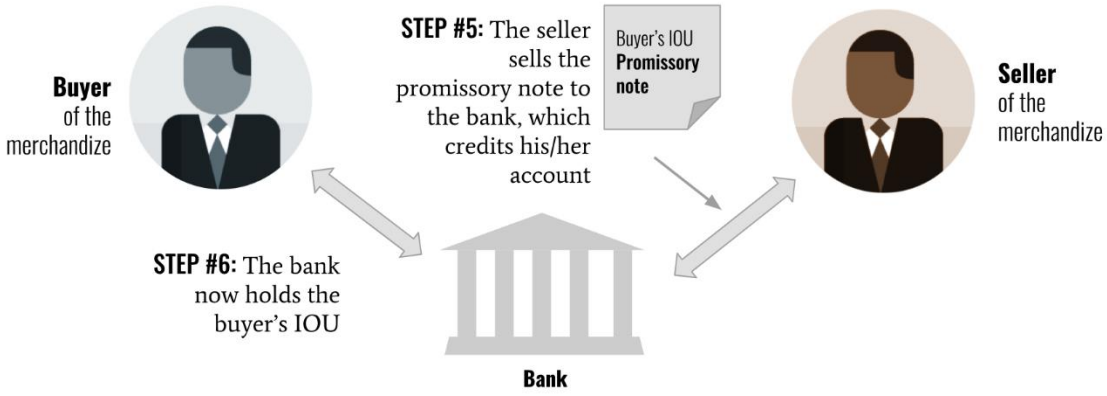
Note: [1] adaptation from (Warburg, 1930a), (Steiner, 1922), (Egger & Treman, 1917).

Figure 5. Credit relations schema under promissory (accommodation) note[1] (steps #3 & #4)



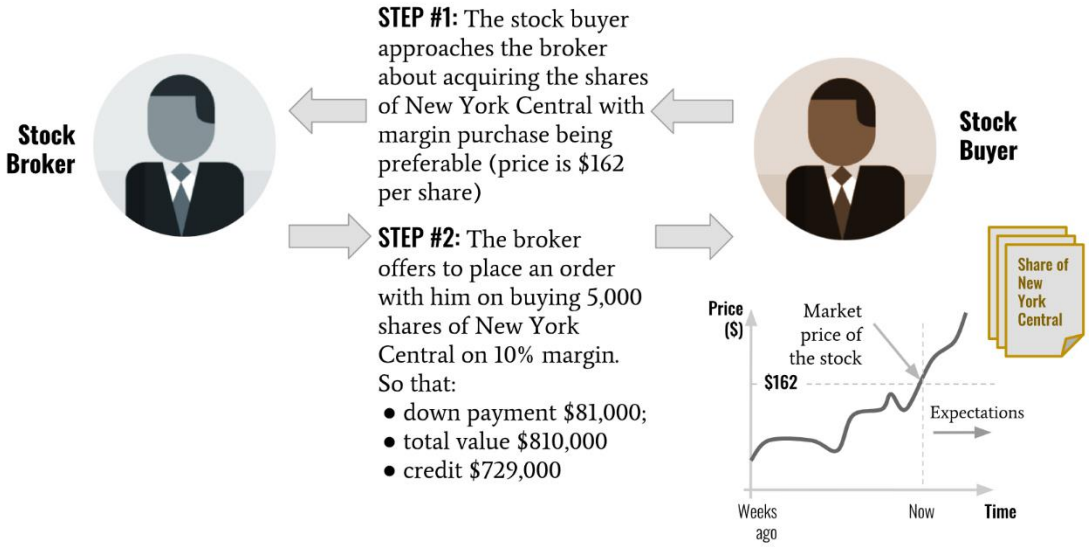
Note: [1] adaptation from (Warburg, 1930a), (Steiner, 1922), (Egger & Treman, 1917).

Figure 6. Credit relations schema under promissory (accommodation) note[1] (steps #5 & #6)



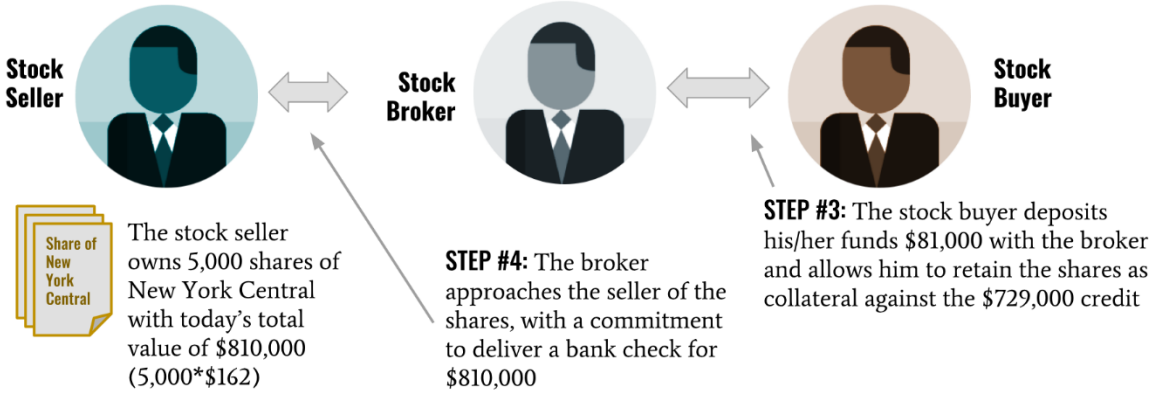
Note: [1] adaptation from (Warburg, 1930a), (Steiner, 1922), (Egger & Treman, 1917).

Figure 7. Credit relations schema under purchasing securities on margin[1] (steps #1 & #2)



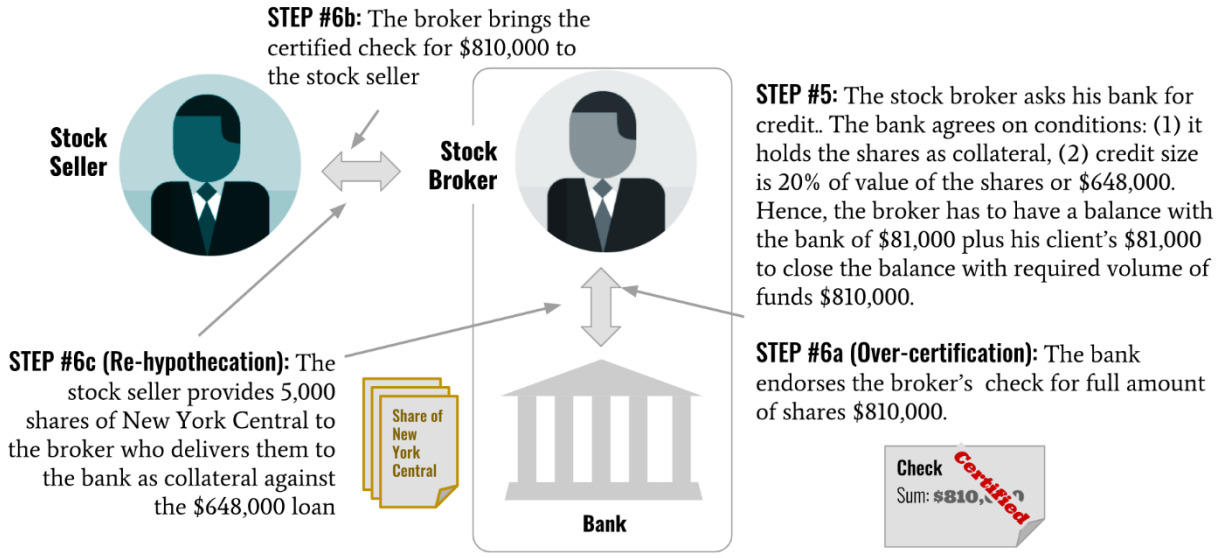
Note: [1] adaptation from (Pratt, 1903, pp. 181-199) primarily while (Carman, 1915) and (Myers, 1931) serve as supporting sources.

Figure 8. Credit relations schema under purchasing securities on margin[1] (steps #3 & #4)



Note: [1] adaptation from (Pratt, 1903, pp. 181-199) primarily while (Carman, 1915) and (Myers, 1931) serve as supporting sources.

Figure 9. Credit relations schema under purchasing securities on margin[1] (steps #5 & #6)



Note: [1] adaptation from (Pratt, 1903, pp. 181-199) primarily while (Carman, 1915) and (Myers, 1931) serve as supporting sources.

Table 1. Balance sheets of key business units involved in purchase of stock on margin[1]: 5,000 shares of New York Central, market price is $162 a share, margin requirement is 10% (based upon example adopted from (Pratt, 1903, pp. 181-199)

Price	Quantity	Broker		Buyer		Seller		Bank	
$162/ share	5,000 shares	Assets	Liabilities / Equity	Assets	Liabilities / Equity	Assets	Liabilities / Equity	Assets	Liabilities / Equity
Initial balances of the major market players									
Step 1	Initial bal's	81,000 Bank acc	81,000 Equity	81,000 Bank acc	81,000 Equity	810,000 Securities	810,000 Equity	162,000 Reserves	81,000 Broker acc
									81,000 Buyer acc
	Balances	81,000	81,000	81,000	81,000	810,000	810,000	162,000	162,000
The broker, which still has only $81,000 balance at bank account, has to deliver $810,000 to the seller. He asks bank for certified check of $810,000 (over-certification), which is intra-day loan of $729,000									
Step 2		729,000 Bank acc	729,000 IOU to Bank					729,000 Broker IOU	729,000 Broker acc
	Balances	810,000	810,000	81,000	81,000	810,000	810,000	891,000	891,000
The buyer gives the broker the check 81,000 for margin purchase of 5,000 NY Central stock on 10% margin. This implies credit from broker of $729,000.									
Step 3		81,000 Bank acc	810,000 Sec's due	810,000 Sec's due	729,000 IOU to Broker				-81,000 Buyer acc
		729,000 Buyer's IOU		-81,000 Bank acc					81,000 Broker acc
	Balances	1,620,000	1,620,000	810,000	810,000	810,000	810,000	891,000	891,000
The broker delivers certified check to the seller, the latter accepts certified check from the bank and draws the funds from the broker's bank account and sells his shares									
Step 4		-810,000 Bank acc				-810,000 Securities			-810,000 Broker acc
		810,000 Securities				810,000 Bank acc			810,000 Seller acc
	Balances	1,620,000	1,620,000	810,000	810,000	810,000	810,000	891,000	891,000

Price	Quantity	Broker		Buyer		Seller		Bank	
$162/ share	5,000 shares	Assets	Liabilities / Equity	Assets	Liabilities / Equity	Assets	Liabilities / Equity	Assets	Liabilities / Equity
The broker after accepting the funds from the buyer reduces his indebtedness to the bank by the same amount of funds received from the buyer									
Step 5		-81,000 Bank acc	-81,000 IOU to Bank					-81,000 Broker IOU	-81,000 Broker acc
	Balances	1,539,000	1,539,000	810,000	810,000	810,000	810,000	810,000	810,000
The broker assigns securities bought as owned by the buyer									
Step 6		-810,000 Securities	-810,000 Sec's due	-810,000 Sec's due					
				810,000 Securities					
	Balances	729,000	729,000	810,000	810,000	810,000	810,000	810,000	810,000
CLOSING BALANCES									
		729,000 Buyer's IOU	81,000 Equity	810,000 Securities	81,000 Equity	810,000 Bank acc	810,000 Equity	162,000 Reserves	810,000 Seller acc
			648,000 IOU to Bank		729,000 IOU to Broker			648,000 Broker IOU	0 Buyer acc
									0 Broker acc
	Balances	**729,000**	**729,000**	**810,000**	**810,000**	**810,000**	**810,000**	**810,000**	**810,000**

Note: [1] adaptation from (Pratt, 1903, pp. 181-199) primarily while (Carman, 1915) and (Myers, 1931) serve as supporting sources; [2] shortages used: "acc" account, "Sec's" securities.

Table 2. Balance sheets of key business units involved in purchase of stock on margin[1]: 5,000 shares of New York Central, market price is $175 a share, margin requirement is 10% (based upon example adopted from (Pratt, 1903, pp. 181-199)

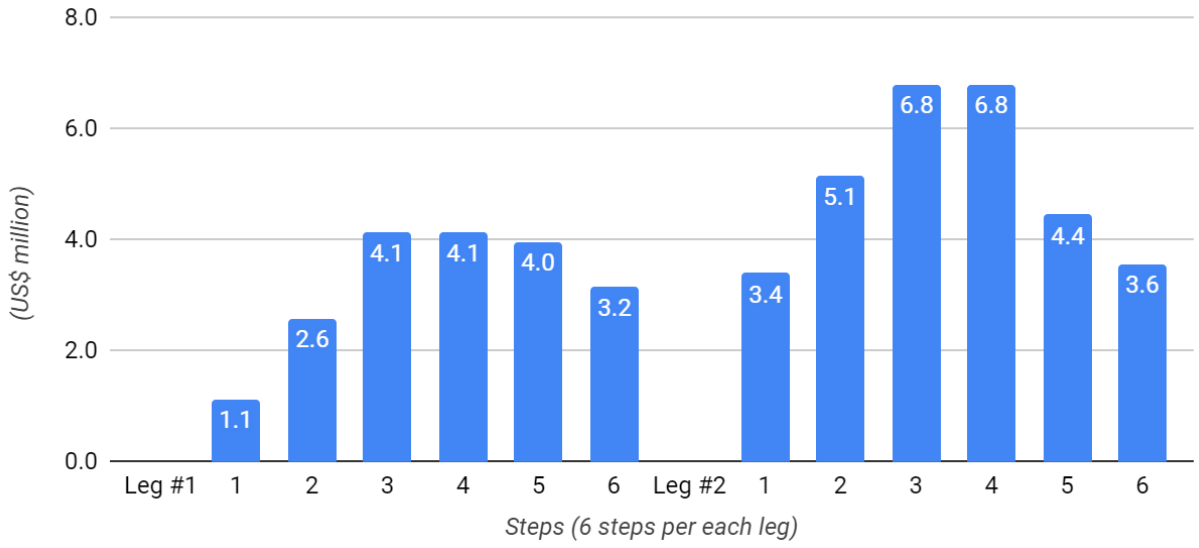
Price	Quan-tity	Broker		"Old" Buyer (now Seller)		"Old" Seller		"New" Buyer		Bank	
$175 /share	5,000 shares	Assets	Liabilities / Equity	Assets	Liabilities / Equity	Assets	Liabilities / Equity	Assets	Liabilities / Equity	Assets	Liabilities / Equity
Initial balances of the major market players: past balance plus new buyer shows up with cash, which he/her deposits with the bank. The bank converts cash into central bank reserves (not shown)											
Step 1	Initial balances	729,000	81,000	875,000	146,000	810,000	810,000	87,500	87,500	249,500	810,000
		Buyer's IOU	Equity	Securi-ties	Equity	Bank acc	Equity	Bank acc	Equity	Reserves	Seller acc
			648,000		729,000					648,000	0
			IOU to Bank		IOU to Broker					Broker IOU	Old Buyer acc
											87,500
											New Buyer acc
											0
											Broker acc
	Balances	729,000	729,000	875,000	875,000	810,000	810,000	87,500	87,500	897,500	897,500
The old buyer (now seller) who wants to "take profit" thanks to share price increase and places the sell order with the broker, who has to find a buy order from new buyer. Hence, the broker firstly secures certified check for $875,000 from the bank as his own balance is zero.											
Step 2		875,000	875,000							875,000	875,000
		Bank acc	IOU to Bank							Broker IOU	Broker acc
	Balances	1,604,000	1,604,000	875,000	875,000	810,000	810,000	87,500	87,500	1,772,500	1,772,500
The new buyer gives the broker the check 87,500 for margin purchase of 5,000 NY Central stock on 10% margin. This implies credit from broker of $729,000.											
Step 3		87,500	875,000					-87,500	787,500		-87,500
		Bank acc	Sec's due					Bank acc	IOU to Broker		New Buyer acc
		787,500						875,000			87,500
		Buyer's IOU						Sec's due			Broker acc
	Balances	2,479,000	2,479,000	875,000	875,000	810,000	810,000	875,000	875,000	1,772,500	1,772,500

Price	Quan-tity	Broker		"Old" Buyer (now Seller)		"Old" Seller		"New" Buyer		Bank	
$175 /share	5,000 shares	Assets	Liabilities / Equity	Assets	Liabilities / Equity	Assets	Liabilities / Equity	Assets	Liabilities / Equity	Assets	Liabilities / Equity
The broker delivers certified check to the seller, the latter accepts certified check from the bank and draws the funds from the broker's bank account and sells his shares											
Step 4		-875,000 Bank acc		-875,000 Securities							-875,000 Broker acc
		875,000 Securities		875,000 Bank acc							875,000 Old Buyer acc
	Balances	2,479,000	2,479,000	875,000	875,000	810,000	810,000	875,000	875,000	1,772,500	1,772,500
The broker and old buyer deleverage from past purchase on margin.											
Step 5		-729,000 Old Buyer IOU		-729,000 Bank acc	-729,000 IOU to Broker						-729,000 Old Buyer acc
		729,000 Bank acc									729,000 Broker acc
		-735,500 Bank acc	-735,500 IOU to Bank							-735,500 Broker IOU	-735,500 Broker acc
		-81,000 Bank acc	-81,000 IOU to Bank							-81,000 Broker IOU	-81,000 Broker acc
	Balances	1,662,500	1,662,500	146,000	146,000	810,000	810,000	875,000	875,000	956,000	956,000
The broker assigns securities bought as owned by the new buyer											
Step 6		-875,000 Securities	-875,000 Sec's due					-875,000 Sec's due			
								875,000 Securities			
	Balances	787,500	787,500	146,000	146,000	810,000	810,000	875,000	875,000	956,000	956,000
CLOSING BALANCES											
		0	81,000	146,000	146,000	810,000	810,000	0	87,500	249,500	810,000

Price	Quan-tity	Broker		"Old" Buyer (now Seller)		"Old" Seller		"New" Buyer		Bank	
$175 /share	5,000 shares	Assets	Liabilities / Equity	Assets	Liabilities / Equity	Assets	Liabilities / Equity	Assets	Liabilities / Equity	Assets	Liabilities / Equity
		Bank acc	Equity	Bank acc	Equity	Bank acc	Equity	Bank acc	Equity	Reserves	Seller acc
		787,500	706,500	0	0	0	0	875,000	787,500	706,500	146,000
		Buyer IOU	IOU to Bank	Securities	IOU to Broker	Securities	IOU to Broker	Securities	IOU to Broker	Broker IOU	Old Buyer acc
											0
											New Buyer acc
											0
											Broker acc
	Balances	**787,500**	**787,500**	**146,000**	**146,000**	**810,000**	**810,000**	**875,000**	**875,000**	**956,000**	**956,000**

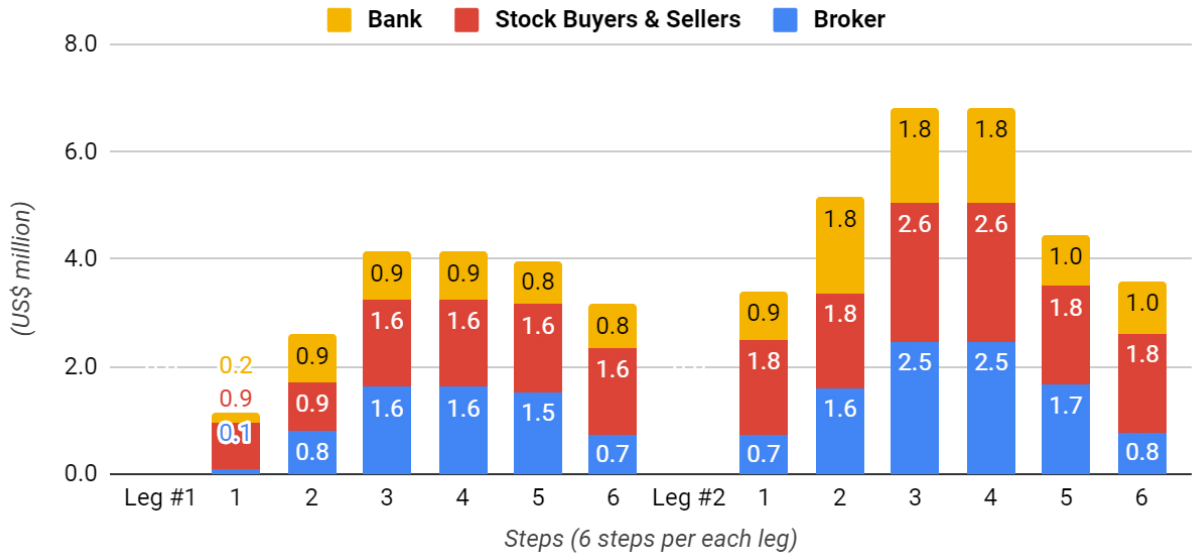
Note: [1] based upon the balances expounded in Table 1, p. 101; [2] shortages used: "acc" account, "Sec's" securities.

Figure 10. Graphical depiction of <u>total *gross* financial assets</u> of all business units involved in purchase of stock on margin (US$ million, total):
case #1 is from Table 1 on p. 101 and case #2 is from Table 2 on p. 103



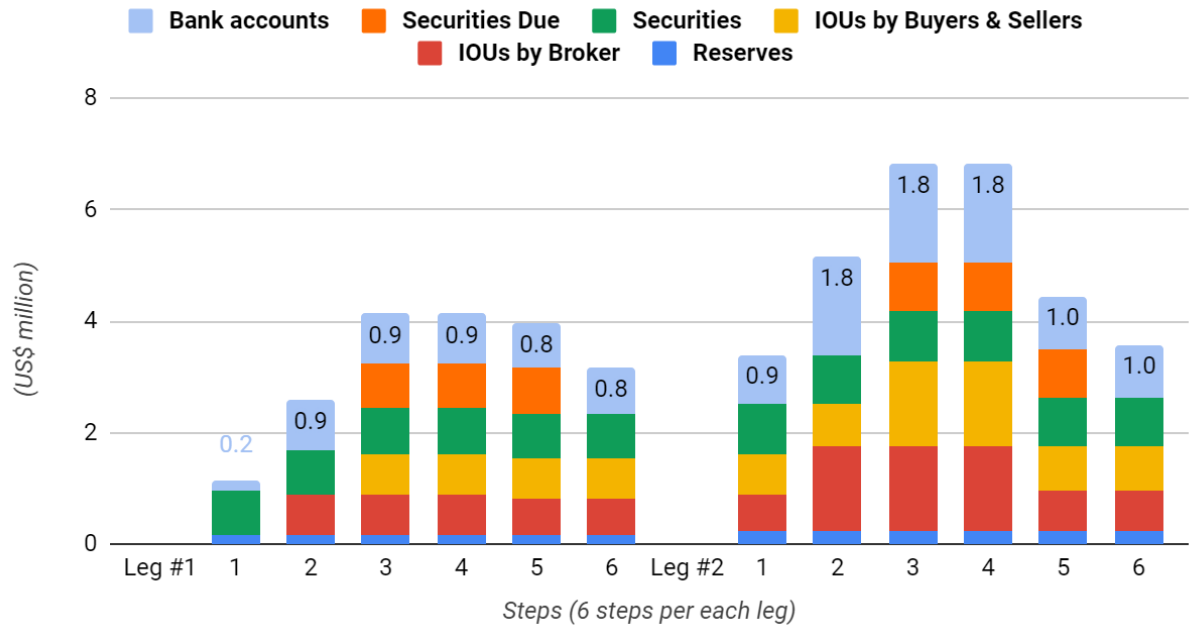
Note: step 1 is total for opening balances and step 6 is total for closing balances.

Figure 11. Graphical depiction of <u>total *gross* financial assets</u> of all business units involved in purchase of stock on margin (US$ million, breakdown by business type):
case #1 is from Table 1 on p. 101 and case #2 is from Table 2 on p. 103



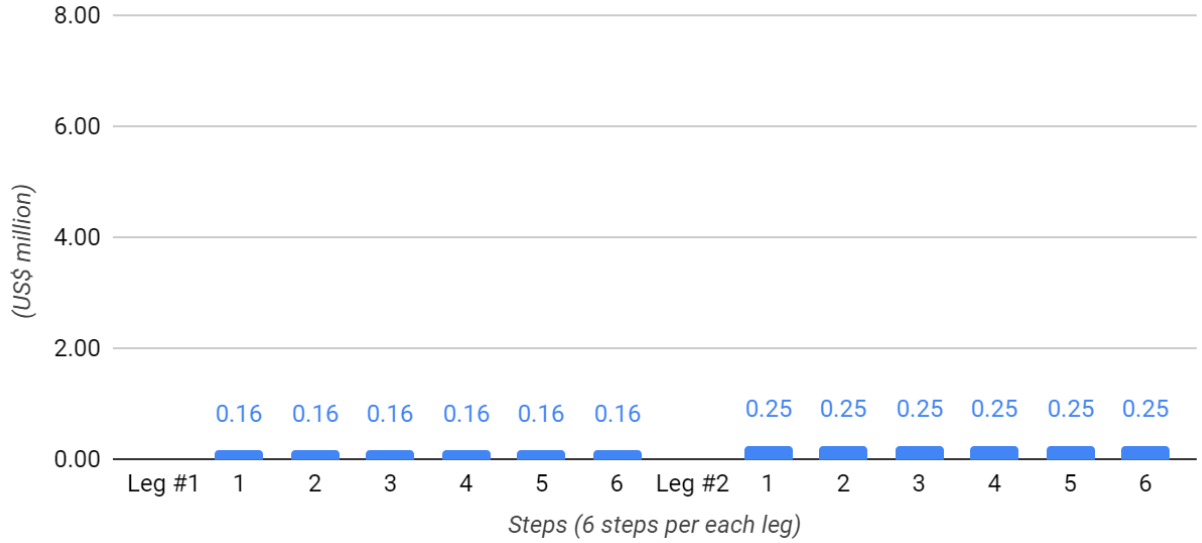
Note: step 1 is total for opening balances and step 6 is total for closing balances.

Figure 12. Graphical depiction of <u>total *gross* financial assets</u> of all business units involved in purchase of stock on margin (US$ million, breakdown by business type):
case #1 is from Table 1 on p. 101 and case #2 is from Table 2 on p. 103



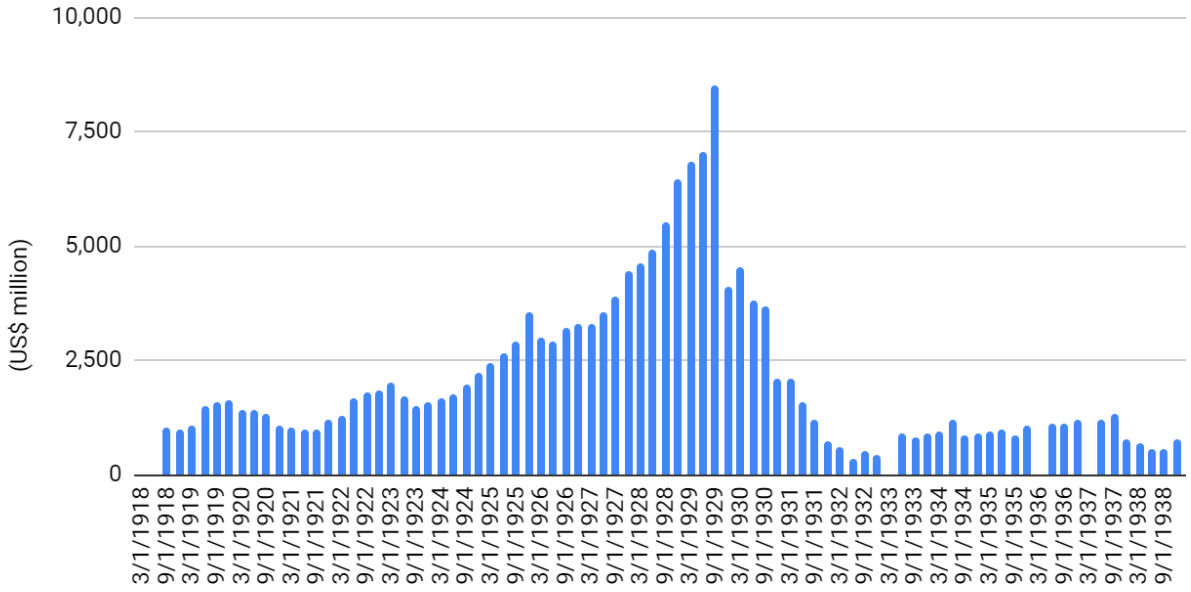
Note: step 1 is total for opening balances and step 6 is total for closing balances.

Figure 13. Graphical depiction of <u>total *net* financial assets</u> of all business units involved in purchase of stock on margin (US$ million):
case #1 is from Table 1 on p. 101 and case #2 is from Table 2 on p. 103



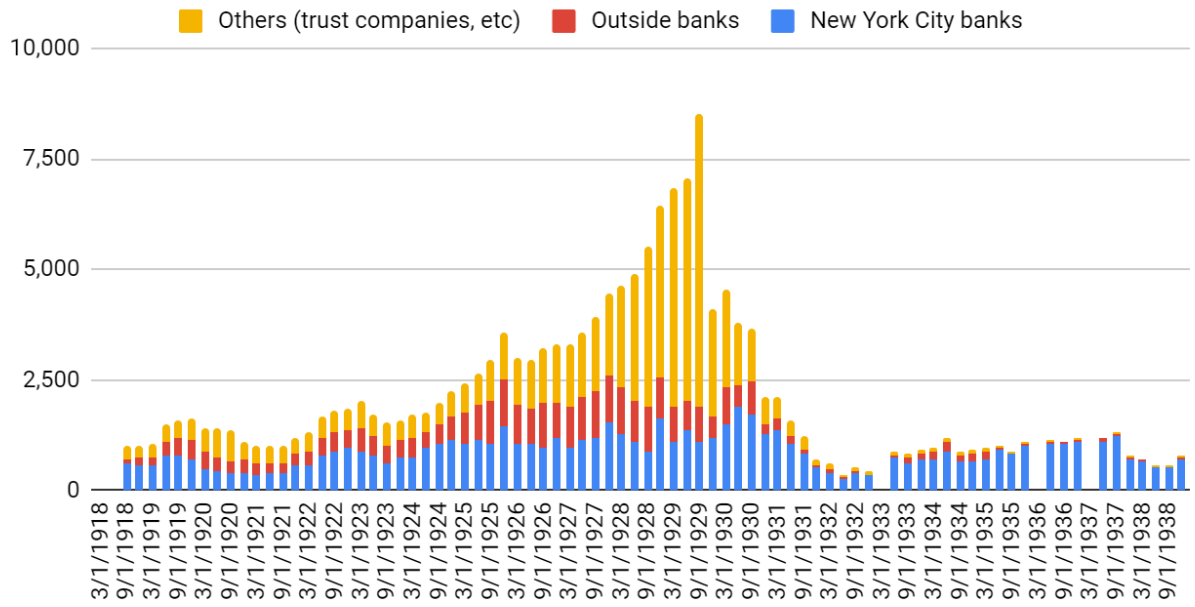
Note: step #1 is total for opening balances and step #6 is total for closing balances; it is assumed that reserves in 1st leg amount to total of bank's IOUs worth of $162,000 and held by the rest of business units like stock broker and stock buyer and seller; at the beginning of the 2nd leg it is assumed that new buyer enters the market and deposits cash with the bank, increasing reserves by $87500 to $249,500.

Figure 14. Brokers' loans, quarterly data from September 1918 through December 1938 (US$ millions)



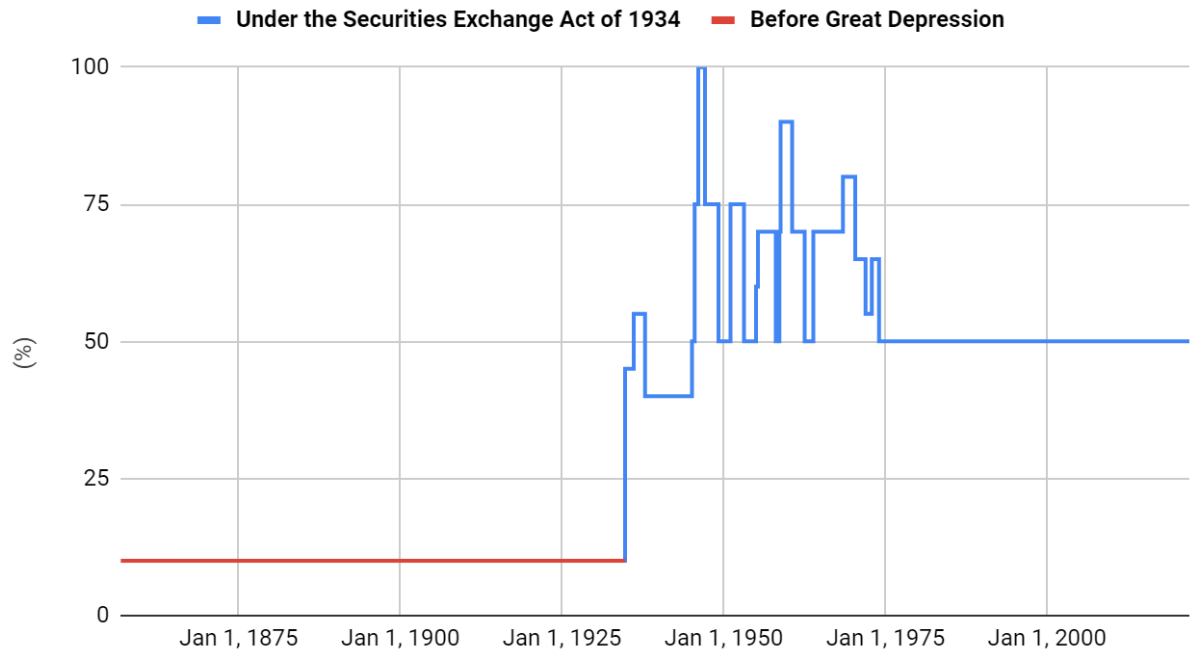
Source: Table 139, Banking and Monetary Statistics 1914 -1941. (Board of Governors of the Federal Reserve System, 1943, p. 494)

Figure 15. Brokers' loans by three groups of lenders (New-York City banks, outside banks, and others), quarterly data from September 1918 through December 1938 (US$ millions)



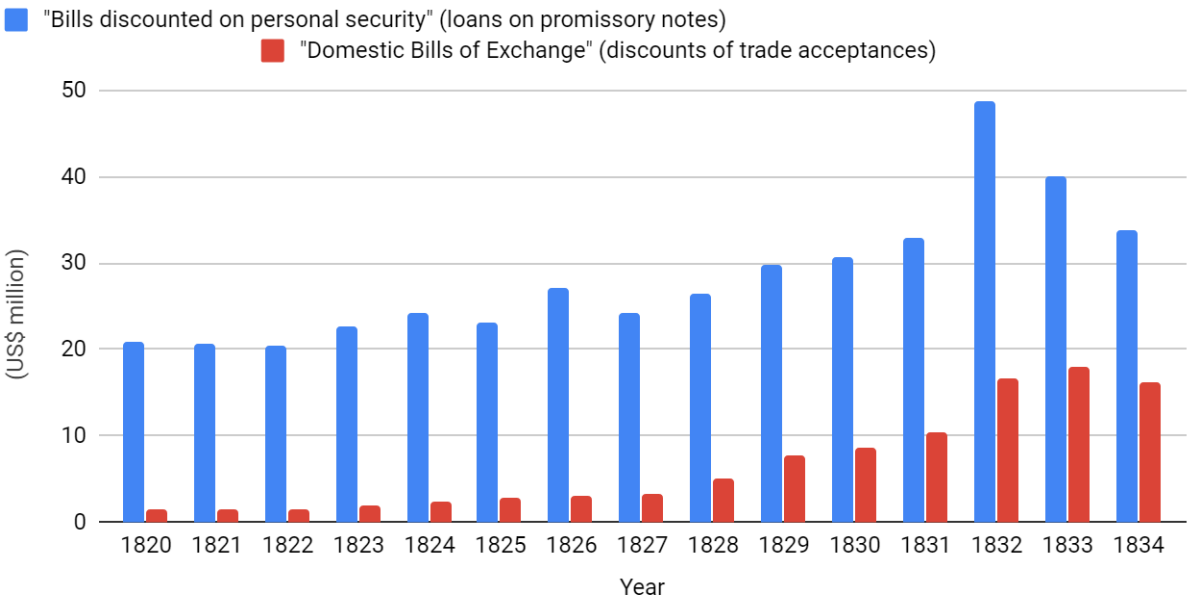
Source: Table 139, Banking and Monetary Statistics 1914 -1941. (Board of Governors of the Federal Reserve System, 1943, p. 494)

Figure 16. History of the most possibly liberal margin requirement* (% of market value)



*Note: * the margin requirement, expressed as a percentage, is the difference between the market value of the securities being purchased or carried (100 percent) and the maximum loan value of the collateral.*
Source: Board of Governors of the Federal Reserve System.

Figure 17. Type of loans at the Bank of United States (in thousands of dollars, at date nearest to January 1st each year)



Source: (Myers, 1931, p. 50)

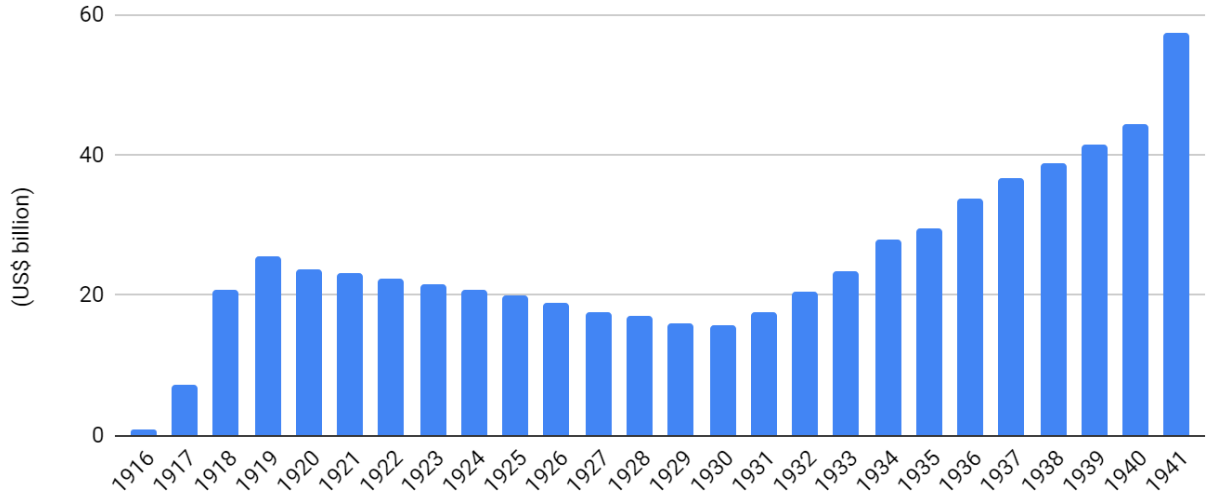
Table 3. Differences between credit systems of the US and Europe's major economies prior the Federal Reserve Act of 1913

	United States	**Europe (UK, France, Germany)**
Commercial credit methods	Primary: Promissory notes. Secondary: Trade acceptances.	Primary: Trade acceptances (bills of exchange). Secondary: Promissory notes.
"Cash" advances when IOU is created (Yes/No)	Yes	No
Mobility of primary commercial credit method	Promissory note is issued by a merchant, who is commercial borrower. The note is discounted by a bank or by a corporation. It is usually held up to maturity by the holder.	Trade acceptance is issued by a merchant-seller (commercial creditor) and accepted by merchant-buyer (commercial borrower). Usually, it has 3-month tenor. It is subsequently endorsed by the banker.
Secondary market	Depends on the chance of finding another bank which may be willing to give the credit. In effect, promissory notes are immobilized.	The note is readily negotiated by the buyer if the profit could be realised. The holder is able to dispose the note either through private discounting or via a central bank (Bank of England, Banque de France, Reichsbank).
Central bank (Yes/No)	No	Yes
Status of bank assets, consisting of commercial credit	"Slow" (illiquid) assets	"Quick" (liquid) assets
US invention: "quick assets" at NYSE	The New York stock exchange and the call money market as creators of supposedly "quick" liquid assets for the US banks and non-bank finance businesses	No analogy
Counterbalance to the bank call/demand deposits	Call/demand loans via call money market (New York stock exchange) with collateral being stocks and bonds traded on the exchange	Trade acceptances serve as call quick assets disposable on demand
Stock exchange "cash" settlements	Daily settlements	Fortnight / monthly settlements
During period of tight money	Spike of interest rates at the call money market, fears of bank runs, depression	Banks rediscount the trade acceptances (bills of exchange) with short maturity via the central bank

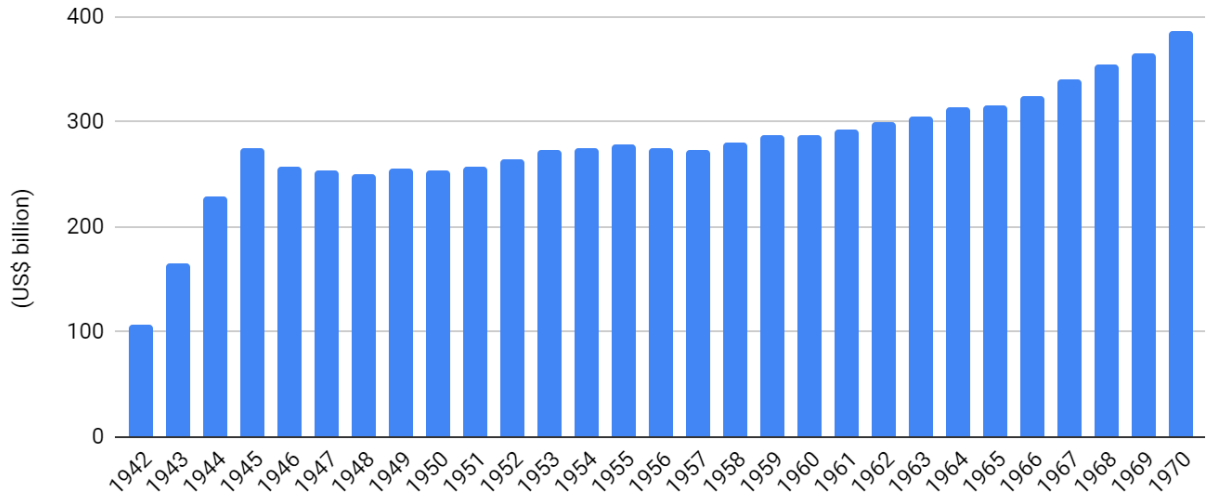
Source: Adaptation from Warburg (1930a, pp. 9-11).

Figure 18. US government interest-bearing debt 1916-1970 (US$ billions)

PANEL A: Years of 1916-1941



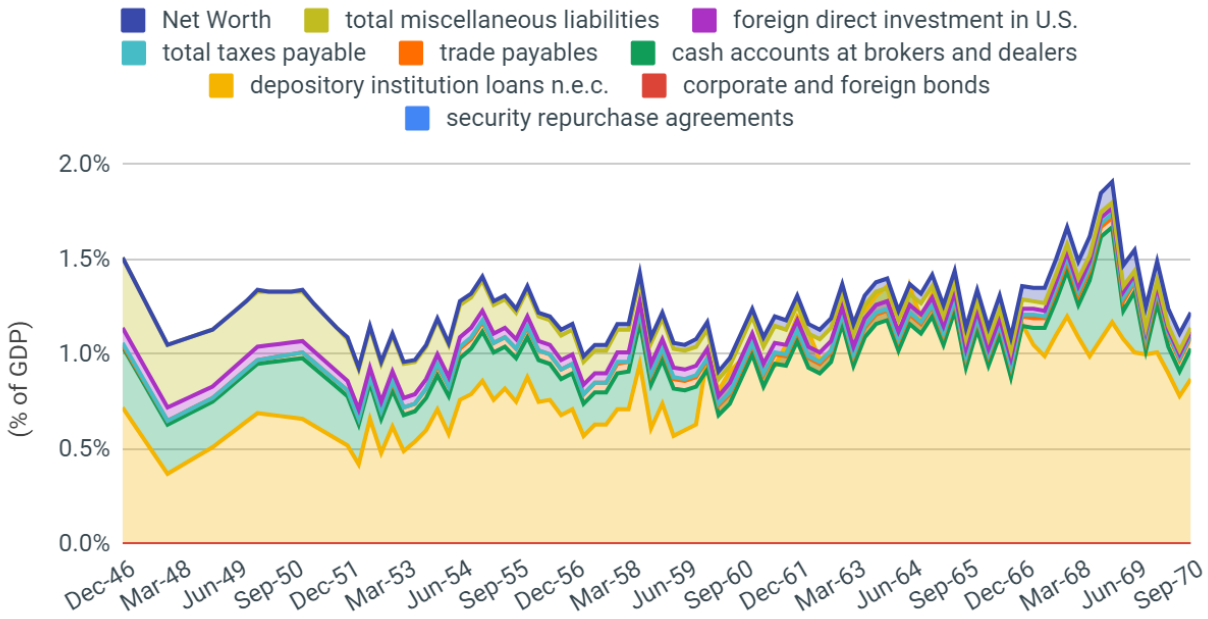
PANEL B: Years of 1942-1970



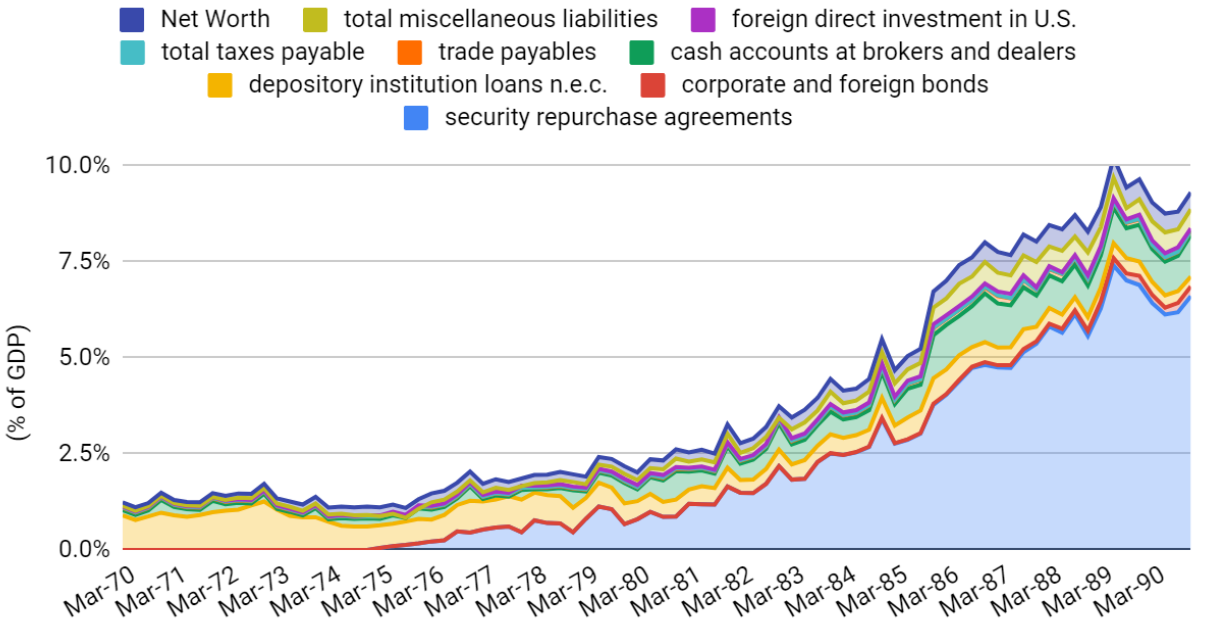
Source: PANEL A -- Table 146, Banking and Monetary Statistics 1940-1970. (Board of Governors of the Federal Reserve System, 1943, p. 494); PANEL B -- Table 13.2, Banking and Monetary Statistics 1940-1970. (Board of Governors of the Federal Reserve System, 1976, pp. 868-873).

Figure 19. Liabilities structure of the US broker-dealers (% of GDP)

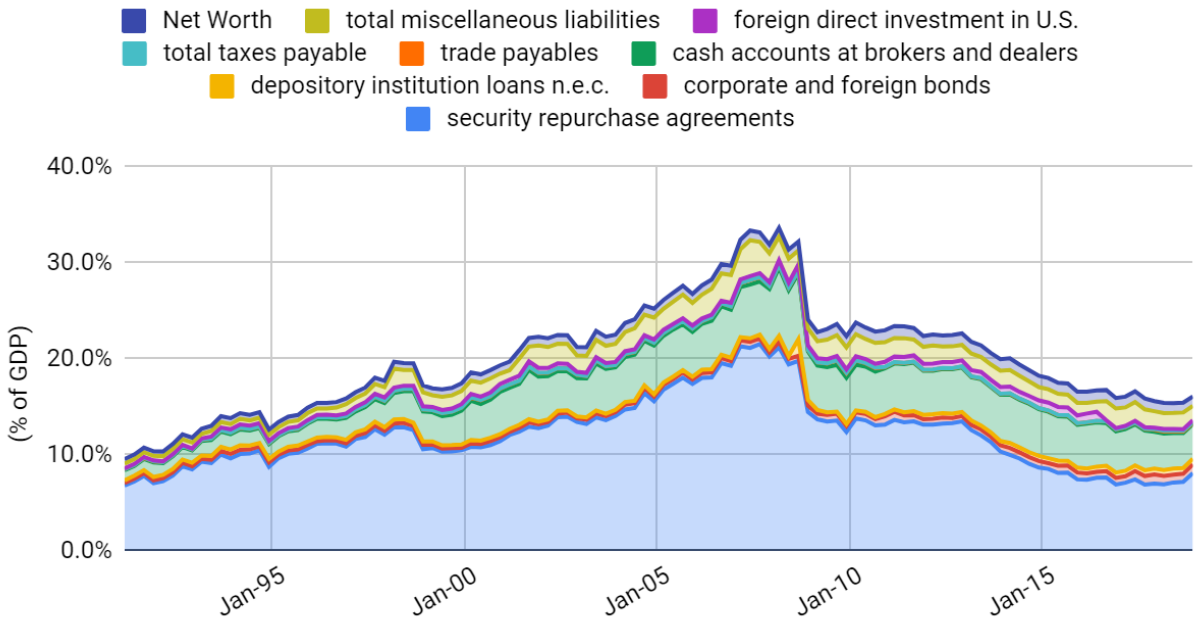
PANEL A: Quarterly data from 4Q of 1946 through 3Q of 1970



PANEL B: Quarterly data from 1Q of 1970 through 4Q of 1990



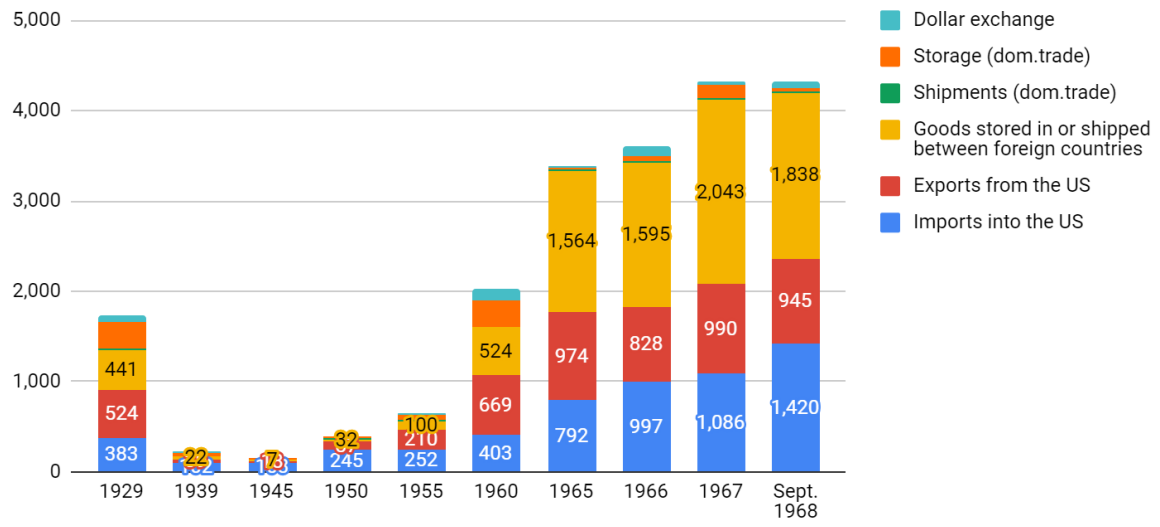
PANEL C: Quarterly data from 1Q of 1991 through 4Q of 2018



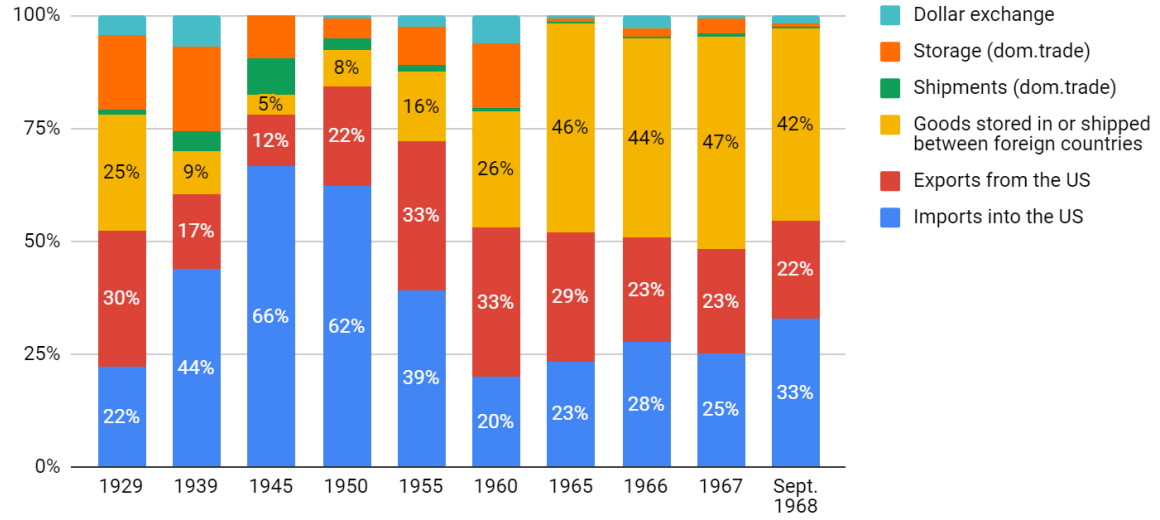
Source: Financial Accounts of the United States - Z.1, Board of Governors of the Federal Reserve System (https://www.federalreserve.gov/releases/z1/current/).

Figure 20. Dollar acceptances outstanding, classified by type of transaction, 1929-1968

PANEL A: Volumes in US$ million



PANEL B: Shares in percentage of total



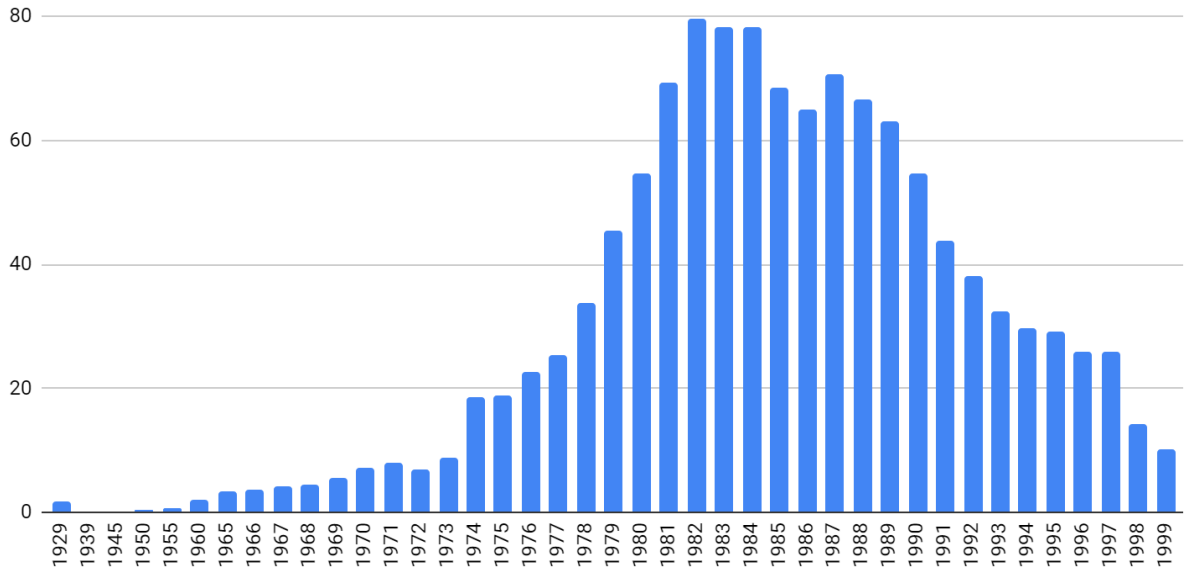
Source: Table 4 on p. 115, which is borrowed from (Cooper, 1969, p. 67).

Table 4. Dollar acceptances outstanding, classified by type of transaction, 1929-1968 (US$ million)

Type of transaction	1929	1939	1945	1950	1955	1960	1965	1966	1967	Sept. 1968
International trade	1,348	163	128	364	562	1,596	3,330	3,420	4,119	4,203
Imports into the US	383	102	103	245	252	403	792	997	1,086	1,420
Exports from the US	524	39	18	87	210	669	974	828	990	945
Goods stored in or shipped between foreign countries	441	22	7	32	100	524	1,564	1,595	2,043	1,838
Domestic trade	308	54	27	28	63	308	35	80	161	46
Shipments	23	10	12	10	9	13	11	15	19	9
Storage	285	44	15	18	54	295	24	65	142	37
Dollar exchange	76	16		2	17	122	27	103	37	78
Total	**1,732**	**233**	**155**	**394**	**642**	**2,026**	**3,392**	**3,603**	**4,317**	**4,327**

Source: (Cooper, 1969, p. 67).

Figure 21. Dollar acceptances outstanding, classified by type of transaction, 1929-1999 (US$ trillion, at current prices)



Source: (Cooper, 1969, p. 67) and Federal Reserve Bulletin.

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