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Working paper

Tripping over the edge of the cliff – business and credit cycles, financial instability and recession triggers

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Abstract

The paper presents a quasi-historiographical or “narrative” analysis of the most critical developments occurring prior to and through the last nine recessions in light of Minsky’s theory of financial instability. We identify a pattern of events that can be used as a checklist that provides qualitative information for assessing probabilities of near-time recessions. In the broadest sense, the sequence of events that we identify starts with an increase in leverage in one or more segments of the economy followed by an increase in interest rates and financial conditions tightening, credit quality deterioration, a varying degree of credit rationing or a credit crunch, monetary policy relaxation, and ends with deleveraging. The pattern is present and documented for all U.S. cycles in the period 1954-2010. Applying the checklist to the current economic conditions in the U.S. as of the end of 2019 suggests that the catalyst for the next recession will be business debt and while the credit/business cycle continues to age, the likelihood of a recession over the next twelve months remains moderate due to relatively favorable financial conditions.

Keywords: leverage, business cycle, credit cycle, financial conditions, Minsky’s financial instability hypothesis, recessions

The U.S. economy is in the midst of the longest economic expansion on record. Between the end of the Great Recession in 2Q09 and 2Q19, real GDP and real GDP per capita have increased by 26.7% and 17.1% respectively. At the same time, the rate of unemployment has declined to 3.5% - a level not seen since the 1960s. Inflation pressures remain muted. However, recession probability over the coming 2-year period has increased substantially. At this point in time, it seems like a coin toss whether the U.S. will enter into or avoid an economic contraction.

Determining when a recession¹ will start has proved to be a very difficult task, as the multitude of economic indicators almost never point unequivocally in the same direction far in advance of the start of the downturn. It was because of this that many economists had a difficult time forecasting the 2007-2009 recession with certainty until well into 2008.

The purpose of this working paper is to identify a pattern of events that could be used as markers serving as early warning signals that the economy is indeed slipping into a recession based on developments preceding the last nine recessions. Therefore, we investigate similarities occurring prior to the last nine recessions within the context of each cycle and in the framework of Minsky's theory of financial instability, and we identify a logical pattern that help us determine whether a recession is in the making in the short-term. These assessments are used to complement quantitative estimates of recession probabilities.

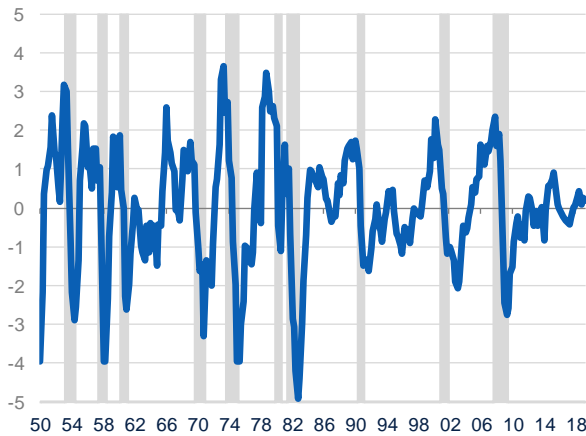
Business cycle, credit cycle or both?

Economic activity oscillates around a generally upward long-term trend, which is observable through the variation in output and its primary measure, Gross Domestic Product (GDP). Several oscillating patterns around the long-term trend have been identified or suggested, each with a different frequency ranging from a couple of years to half a century. The business cycle is an oscillation of activity with a period varying generally between three and ten or more years (Figure 1). Multiple theories have been proposed to identify the cause of this fluctuation, but no consensus has been reached. Some theories locate the primary driver of the cycle within the economic system (the multiplier effect on aggregate demand, investment flows, the supply of money and credit, etc.), while other theories locate it outside the system (commodity prices, technological breakthroughs, wars, epidemics, political events, etc.) (Samuelson & Nordhaus, 2010).

The primary theory that links the credit cycle and the business cycle is the Minsky financial instability hypothesis (Minsky, 1992 and 2008), which gained particular attention in the aftermath of the Great Recession. In effect, the theory puts the credit cycle at the center of the business cycle and ties it to fixed, long-term investment. According to the author: "in a capitalist economy, the past, the present, and the future are linked not only by capital assets and labor force characteristics but also by financial relations" (Minsky, 1992). In essence, the interplay of the factors of production, financial relations and expectations drive the business cycle; such that, activity and debt increase during expansions and slow or contract during recessions. Sometimes, if expectations are excessively high, financial and regulatory conditions are excessively relaxed, or both, debt expansion can significantly outpace production and income over an extensive period of time. The prior three cycles are such episodes (i.e., 1980s, 1990s and 2000s) (Figure 2). In a sense, while the credit cycle was part and parcel of all post-World War II cycles until the early 1980s, the impact of the credit dynamic has intensified since then which is exactly what Minsky expected as early as the 1960s and certainly the 1970s (Minsky, 1963, 1976 and 1982).

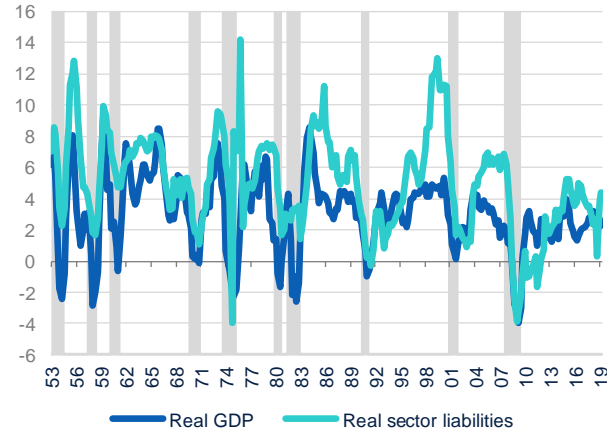
1: Recessions are defined by the National Bureau of Economic Research as periods of "significant decline in economic activity spread across the economy, lasting more than a few months, normally visible in real GDP, real income, employment, industrial production, and wholesale-retail sales." NBER has identified 33 cycles over 1854-2009 in the U.S. alone, lasting on average 4.7 years.

Figure 1 **GDP cyclical component, extracted using time series filter, (% of trend)**



Source: Estimates using BEA data

Figure 2 **GDP and real sector liabilities (households and nonfinancial businesses, %YoY)**



Source: Federal Reserve and BEA

The credit cycle starts in a period of stable economic conditions and moderate growth leading to a relative buildup of debt and leverage over time. After a recession, the economy tends to be dominated by households, businesses and financial institutions that have sustainable levels of indebtedness in light of at the time prevailing structural conditions (institutional, regulatory, monetary, demographic, etc.). These entities generally engage in the most sustainable form of borrowing, which Minsky called “hedge financing”. Hedge financing occurs when an entity is borrowing funds that will be serviced from operating cash inflows that exceed operating cash outflows.

As time goes by, the economic expansion gains traction, and a confluence of progressively higher expectations that are validated over a period of time leads to increasing leverage. Post-recessionary low asset prices, coupled with an almost certain promise of appreciation, produce a wave of investment and borrowing in variable segments of the economy. Most debtors take on additional liabilities knowing them to be covered by current assets or probable income and easily collateralized with the help of increasing asset prices. As time goes by, the share of entities that have less sustainable levels of debt and leverage increases. These are organizations are those whose “contractual cash flow out over a time period exceeds its expected cash flow in”. (Minsky, 2008) Minsky calls this type of borrowing “speculative” and “Ponzi”, depending on the level of leverage. These entities obtain the cash to meet their debt service payments by “selling some assets, rolling over maturing debt, or new borrowing.” (Minsky, 2008) While both types of organizations are unable to service their principal payments out of internally generated cash flows, speculative ones can service at least the interest payments, yet Ponzi organizations cannot even service this portion of their debt service obligations. The Ponzi organizations refinance their interest payments with the support of their temporarily appreciating assets further increasing their leverage. Asset price inflation is an important aspect of the process because it is both a result of the credit expansion and strong expectations, and also supports them in turn forming a positive feedback loop. Interest rates also play an important role, as they determine the debt service burden and the relative sustainability of the outstanding debt. In this way, high interest rates can make a hedge finance unit a speculative one, and a speculative finance unit a Ponzi one; while low interest rates can make a Ponzi or speculative finance unit a hedge one. The motivation for increased leverage is primarily increased profitability which is achieved for a period of time at the expense of greater risk.

The speculative and Ponzi financing entities are obviously intrinsically less stable than hedge finance, as “such units are dependent upon financial market conditions in a more serious way.” (Minsky, 2008) Because of this, an economy that has moved from being dominated by hedge finance to being dominated by a speculative and Ponzi

financing regime becomes inherently unstable. In Minsky’s words: “the greater the weight of speculative and Ponzi finance, the greater the likelihood that the economy is a deviation amplifying system”, having moved away from being an equilibrium seeking and containing system. (Minsky, 1992)

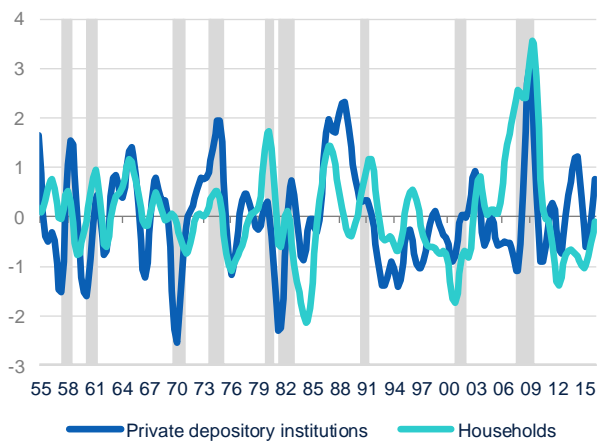
Minsky’s financial instability theory, therefore, ties investment, debt, leverage, operating cash flows, interest service costs and asset prices into one consistent model that goes a long way in explaining the business cycle – the expansion and recession.

Leverage and rates: A genie in a bottle

As evident from the last three cycles (the late 1980s, 1990s and 2000s), strong debt expansion and asset price inflation were able to last for years at a time. As expected, the two forces acted as positive feedback loop and made the economy a deviation amplifying system. However, these periods did eventually come to an end after a rise in interest rates, spike in debt service burdens and some sort of credit rationing based on an increase in anxiety or even panic.

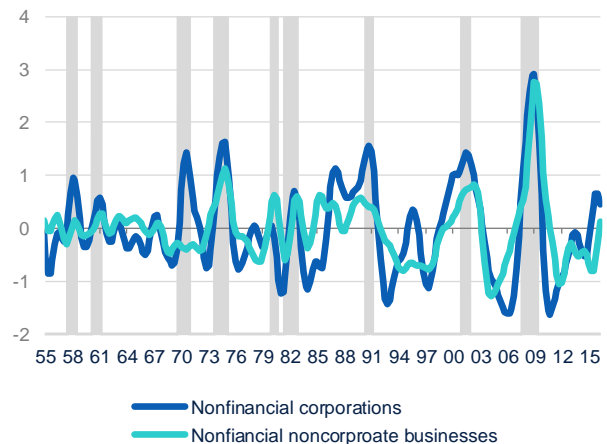
Extraordinary growth in liabilities in one or more segments of the economy preceded each of the recessions. We observe this growth in the cyclical component of outstanding credit relative to GDP among three “real” sections of the U.S. economy: households, nonfinancial corporations and nonfinancial noncorporate businesses. Additionally, we take into consideration the cyclical components of the liabilities of private depository institutions, a rapid increase in which have preceded and amplified some downturns, such as the early 1990s recession (the savings and loans and junk bond crisis). Figures 3 and 4 show that household leverage was the primary driver behind the Great Recession, while business sector leverage was behind the downturns in the early 1990s and early 2000.

Figure 3 **Liabilities to GDP, Cyclical Component, (Percentage Points)**



Source: Estimates using Federal Reserve and BEA data

Figure 4 **Liabilities to GDP, Cyclical Component, (Percentage Points)**

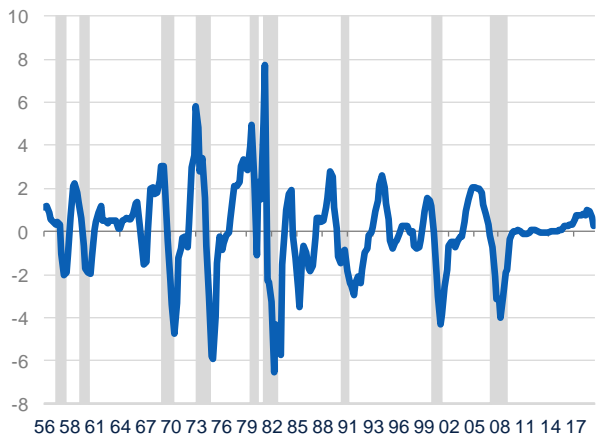


Source: Estimates using Federal Reserve and BEA data

While the buildup in leverage created preconditions for all of the economic downturns that we analyzed, neither occurred before a substantial increase in interest rates, and thus debt service burdens, relative to the preceding period (Figures 5 and 6). When leverage is sufficiently high, even a small increase in interest rates can precipitate a recession, as speculative and hedge finance units are particularly sensitive to the change in the cost of debt. High levels of leverage and interest rates concurrently create more fragile financial structures than each of the two factors separately. This is in line with Minsky’s belief that financial crises require the prior existence of a fragile

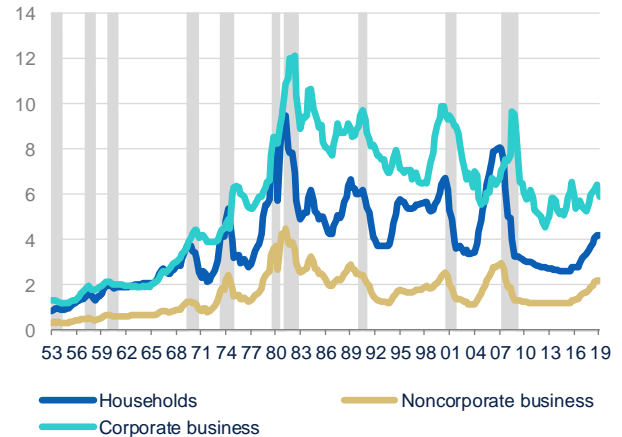
financial structure (Minsky, 1976). In this sense, leverage is the genie which is released from the bottle by higher interest rates and facilitating the flux between financial sustainability and instability.

Figure 5 **Federal Funds Rate, (Percentage Points Difference YoY)**



Source: Federal Reserve

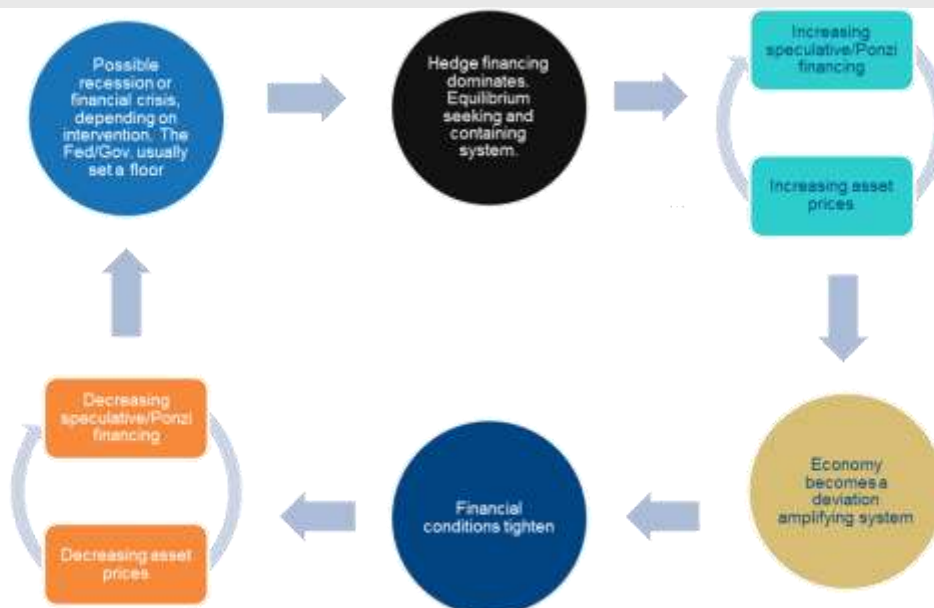
Figure 6 **Implied debt service burden by sector, (% of GDP)**



Source: Calculations using Federal Reserve and S&P Data

That said, while the tightening of financial conditions by the monetary authority marked the end of the process of leveraging and precipitated the turn of the cycle, it was also the intervention of this institution that put a floor in all downturns that we analyzed, in many cases in coordination with other branches of government, acting in a sense as “Big Bank” and “Big Government”, as argued by Minsky. We illustrate the whole cyclical process in Figure 7.

Figure 7 **Stylized financial instability process as per Minsky (1992) within the context of the business/credit cycle**



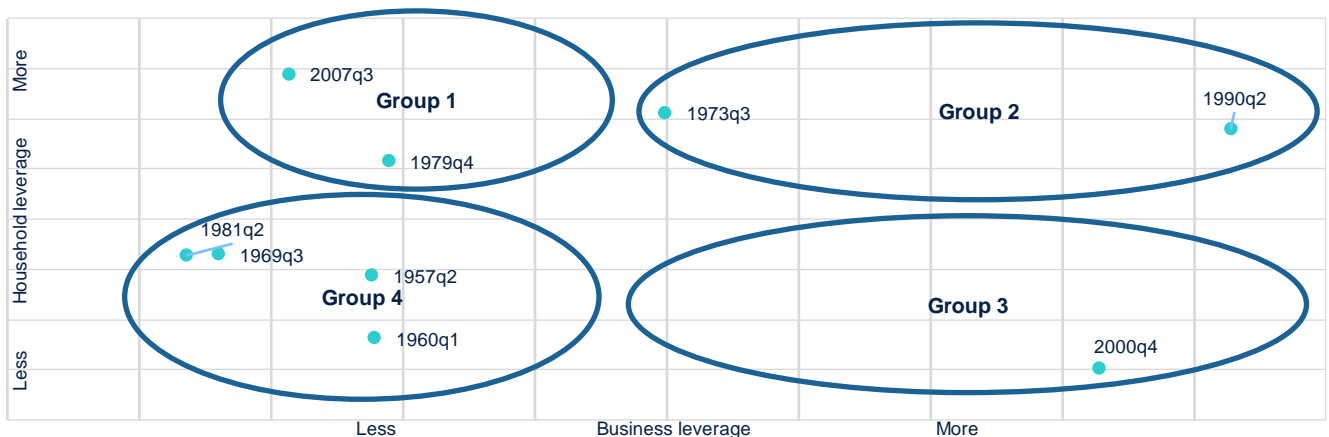
Source: BBVA Research

Clustering the leverage data: Four types of recessions

Prior to analyzing the events leading to and into the last recessions, we seek to better understand in a simplified manner the leverage conditions which trail each downturn. To do this, we use dimension reduction with Principal Component Analysis, which we perform on the leverage-to-GDP cyclical components discussed earlier for the following sectors: households, nonfinancial corporations, nonfinancial noncorporate businesses and private depository institutions. In order to capture the state of leverage one full year prior to each of the downturns, we use the average value of the cyclical component in the four quarters prior to each recessionary quarter determined by the NBER.

The first two principal components explain 80% of the variation in the leverage conditions. Based on an analysis of the loadings in each of the components and the component scores, we identify four classes of leverage expansions, shown in Figure 7. The first group of recessions is characterized by a buildup of excess household leverage and includes the 1980 and 2008 recessions. The second group is described by a leverage buildup in multiple segments of the economy and includes the 1973 and 1990 recessions. The third one represents recessions preceded by leverage buildups by nonfinancial corporations and includes the 2001 recession. The fourth group is characterized by a lack of significant glut in any of the four segments over the immediately preceding year and includes the 1957, 1960, 1969 and 1981 recessions. While the recessions in this last group were not presaged by a significant leverage buildup in the final year prior to the official start of the recession, financial instability could nevertheless ensue due to a relatively aggressive increase in interest rates, resulting in an increase in debt service costs or regulatory changes. Additionally, in the cases of the 1957 and 1960 recessions, the credit expansion slowdown was already taking place a year before the end of each business cycle, and, thus, these recessions are classified as they are in our matrix².

Figure 8 **Recession clustering based on type of leverage buildup**



Source: BBVA Research

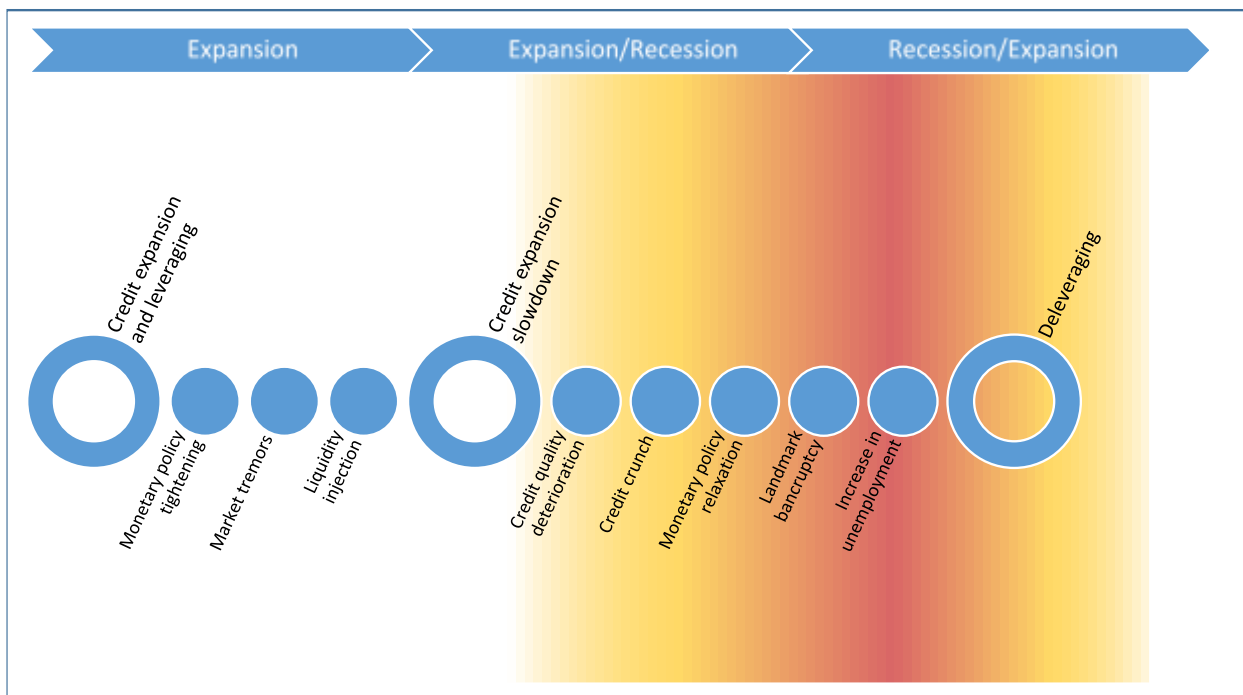
2: Household leverage had been accelerated during the 1954-1957 and 1958-1960 expansion, but had been tempered with Federal Reserve action prior to building up substantially relative to its long-term trend and had already been slowing down considerably prior to the start of these two recessions.

Historiographical review: A recurring pattern

Having understood the type of leverage buildup occurring prior to the each of the recessions, we conduct a quasi-historiographical review and summarize our findings using a condensed version of the “narrative approach” as per Romer and Romer (1989). In our analysis, we use documents and data covering a roughly two-year period prior to each downturn, as well as the period of the actual recession. Our primary source is the repository of FOMC Records of Policy Actions, Minutes and Conference Call Transcripts; which, are available on the Federal Reserve’s web-site. These materials document in detail the contemporaneous events of each cycle. That said, we also complement them with other documents, studies and data published by the Federal Reserve and FDIC, multiple highly regarded post-mortem assessments of the credit/business cycles, as well as contemporaneous news sources whenever possible.

Our methodology consists of three steps. First, we document the critical events prior to and during the analyzed recessions in an exhaustive table in the appendix. Second, based on this quasi-historiographical review, we identify a pattern of events that occurs just prior to and through the downturns within the context of the financial instability theory. The identified sequence of events is illustrated in Figure 9. While the succession of events and their timing might not occur with complete regularity in each of the observed cycles, there is a significant degree of similarity across all of them. Third, we validate the sequence using the chronologies developed in the first step for each of the nine analyzed recessions.

Figure 9 **Generalized pattern of events identified leading into and through the last nine recessions** (intensity of red color symbolizes degree of severity of economic slowdown)



Source: BBVA Research

The pattern of events that we identified and validated starts with a period of leverage buildup which approaches the maximum level of sustainability in light of increased interest rates or, in some cases, tighter regulation, as the monetary authority seeks to control credit growth and, in some cases, inflation. Financial markets tend to respond with tremors to the decrease in liquidity, increase in uncertainty or perceived counterparty risk. In these circumstances, the Federal Reserve often injects liquidity to calm the markets while continuing to increase interest rates. The result of the tighter financial conditions is deceleration in credit growth. When financial conditions tighten, the highly leveraged entities face obstacles while trying roll over existing debt and start selling assets to meet the initial debt service requirements leading to declines in asset prices. The positive feedback loop that was supportive of increased leverage starts to work in the opposite direction. Lower asset prices result in lower value of pledged collateral, margin calls, increase in delinquencies and credit defaults. If the conditions deteriorate quickly and dramatically and/or the Federal Reserve and the Government do not intervene quickly, a panic of some sort ensues resulting in credit rationing or a credit crunch. “The term “credit crunch” has its origins in the unusually tight credit conditions that prevailed in the U.S. in the late summer of 1966, when reports of borrowers unable to obtain credit at any price were commonplace.” (Owens & Schreft, 1995) Credit crunch is, in essence, an interruption in the supply of credit (Wojnilower, 1980). According to the St. Louis Fed economists Kliesen and Tatom (1992):

“The central feature of a credit crunch—a decline in the growth of credit—has occurred in every period that has been identified as a credit crunch. Such periods also tend to be recessions. For example, Kaufman (1991) cites credit crunches that occurred in 1959, 1969-70, the mid-1970s, 1981-82 and 1990-91. Except for the first, these periods correspond to each of the recessions that have occurred since the late 1950s. The first instance, in 1959, preceded the only other recession since then, the recession from 11/1960 to 1/1961.”

The severity of the recession depends on the size of the imbalances and the intervention of what Minsky called “Big Bank” and “Big Government”. If the buildup of leverage is serious and/or the government and central bank intervention is not sufficient then deleverage sets in, resulting in an extension of the recession or a period of slow growth after the recession.

The results of the validation exercise are summarized in Table 1.

Table 1 **Critical events leading to and into the last nine recessions**

Credit cycle phases and marker events

	Expansion				Expansion/Recession				Recession/ Expansion		
	Credit expansion and leveraging	Monetary policy tightening	Market tremors	Liquidity injection	Credit expansion starts to slow down	Credit quality deteriorates	Credit crunch	Monetary policy relaxation	Landmark bankruptcy	Unemployment increases	Deleveraging
3Q57-2Q58	Household debt (the debt expansion was weakened by the Fed over a year before the start of the recession)	December 1954-October 1957	Treasury market freezes in December 1955, wobbles in April 1957 and freezes again in July 1958 (treasuries sold at fixed prices, no auctions)	Federal Reserve intervenes in December 1955 and in July 1958	1Q55	Likely – there is an increase in allowance for losses to total loans at commercial banks (FDIC data)	Period of “tight credit” in the fall of 1957. (Owens & Schreft, 1995)	November 1957-May 1958	N/A	From 3.7 in March 1957 to 7.5 in July 1958	Slowdown in leverage buildup of households and nonfinancial businesses
2Q60-1Q61	Household debt	August 1958-January 1960	Treasury market freezes in July 1959	Federal Reserve intervenes July - October 1959	3Q59	Likely – there is an increase in allowance for losses to total loans at commercial banks (FDIC data)	3Q59 due to deterioration in liquidity of depository institutions	April 1960 - July 1961	None despite an overall increase in the number of bankruptcies in 1961	From 4.8 in February 1960 to 7.1% in May 1961	None
4Q69-4Q70	No expansion immediately prior to the recession due to deleverage in the wake of the 1966 credit crunch. Credit strain occurs as a result of higher interest rates and a boom-bust cycle in the commercial paper market	November 1967-March 1970. Additionally, fiscal policy tightening through the “Revenue and Expenditure Control Act of 1968”	London gold market freezes in March 1968	No overt liquidity injection due to inflation considerations. The U.S. Congress repeals the requirement for a gold reserve to back the US currency, and a two tier gold system (official/open market) is introduced	3Q69	Yes – Speculative grade corporate bond default rate (trailing 12-month average) reaches 12% in early 1971	3Q69-2Q70 due to deterioration in liquidity of depository institutions, an increase in commercial paper debt, followed by a collapse of the commercial paper market	March 1970-March 1971	Penn Central Corp. (largest railroad and one of the largest nonfinancial corporations of its time)	From 3.9% in 1969 to 6.1 in December 1970	Nonfinancial corporate businesses levering ends and slight deleverage sets in.

	Expansion				Expansion/Recession				Recession/ Expansion		
	Credit expansion and leveraging	Monetary policy tightening	Market tremors	Liquidity injection	Credit expansion starts to slow down	Credit quality deteriorates	Credit crunch	Monetary policy relaxation	Landmark bankruptcy	Unemployment increases	Deleveraging
4Q73-1Q75	Nonfinancial corporate and noncorporate business debt and some household debt. Major bubble is in REITs, which play a major role in a wave of real estate overdevelopment. Many banks exposed to REITs.	March 1972 - September 1973	Stock market starts to fall in January of 1973	December 1973, only after the Arab Oil Embargo took effect	4Q73	Yes – Speculative grade corporate bond default rate increases. Many REITs fail. Increase in business and nonbusiness bankruptcies.	2Q74 due to panic around the collapse of several large financial institutions, uncertainty in the FX market and increasing challenges in the REIT industry	4Q73 and again from 3Q74-2Q75	Kassaba Development Corporation, U.S. National Bank of San Diego, Franklin National Bank and Herstatt bank in Cologne, Germany	From 4.6% in October 1973 to 9% in May 1975	Nonfinancial corporations deleverage until 1980. Noncorporate businesses deleverage until early 1976 and maintain unchanged level of leverage until 1979. Households deleverage until early 1976, after which they start to re-lever again.
1Q80-3Q80	Household debt	January 1978- June 1980	Stock market falls in late 1978, but the decline is modest and likely masked by high inflation rates	None due to concerns about inflation	1Q78	Yes – Increase in bankruptcies	2Q80 due to imposition of credit controls in March 1980	2Q80	Chrysler Corporation (bailed out)	From 6% in November 1979 to 7.8% in July 1980	Households deleverage 1980-1985
3Q81-4Q82	None (result of deleveraging after the 1980 recession)	August 1980 - January 1981	None, likely masked by high inflation	None due to concerns about inflation	1Q81	Yes – Increase in business and nonbusiness bankruptcies	1Q81, mostly in non-financial corporate (through a spike in credit spreads) and also in household credit	3Q81 - 1Q83	None	From 7.2% in July 1981 to 10.8% in November 1982	None additional deleverage other than the household deleverage which was ongoing (no relevering took place after the recession of 1981)
3Q90-1Q91	Nonfinancial corporate and noncorporate business debt as well as household debt. Compounded with weak depository institutions' balance sheets in the wake of the S&L crisis	April 1988-May 1989	S&L crisis deepens at the beginning of 1989. Junk bond market collapses in October 1989	Bailout following the S&L crisis peak.	3Q89	Yes - speculative-grade default rate (trailing 12 month average) reaches close to 12% in 1991. C&I delinquency loan rate at commercial banks reaches 6.8% in 2Q91	3Q90-3Q91 due to banks having restrained lending due to low capital levels. FIRREA prevents S&L to lend aggressively	May-December 1989. Brief pause. November 1990-January 1993	Drexel Burnham Lambert. A number of large S&L failures	From 5.2% in June 1990 to 7.8% in June 1992	Depository institutions deleverage 1991-1997. Nonfinancial noncorporate businesses deleverage 1988-1995. Nonfinancial corporate businesses deleverage 1991-1993. Households deleverage 1992-1993

	Expansion				Expansion/Recession				Recession/ Expansion		
	Credit expansion and leveraging	Monetary policy tightening	Market tremors	Liquidity injection	Credit expansion starts to slow down	Credit quality deteriorates	Credit crunch	Monetary policy relaxation	Landmark bankruptcy	Unemployment increases	Deleveraging
1Q01-4Q01	Nonfinancial corporate and to some extent noncorporate business debt	March 1994-August 1998 and February 1999 - June 2000	September 1998 and NASDAQ crash (peak in March 2000)	Federal Reserve facilitates the rescue of LTCM without lending its own funds. The Federal Reserve injects liquidity during the September 11 attacks (during the recession)	3Q00	Yes – increase in bond default rates and loan delinquencies (primarily C&I)	2Q01-2Q02 Some reduction in credit availability to corporations due to tighter credit terms and lower asset valuations	December 2000 – July 2003	IT firms triggering the NASDAQ sell-off. Many .com companies. Enron. WorldCom	From 3.9% in December 2000 to 6.3% in June 2003	Nonfinancial corporate businesses deleverage through 2004
4Q07-2Q09	Household debt	June 2004 – July 2006 (rates on hold thereafter until July 2007)	Subprime mortgage crash in 2Q07. Derivatives amplify the effects dramatically	Fed and ECB injections starting in 3Q07. Introduction of programs such as TAF, TSLF and TARP	3Q07	Yes – Mortgage delinquency rates increase from below 2% to over 11%	3Q07 – due to general apprehension about increased credit risk, especially aggravated as banks suspected other banks of potential illiquidity	July 2007 – November 2015	Washington Mutual, Countrywide, Lehman Brothers	From 4.7% in November 2007 to 9.5% in June 2009	Household deleverage through 2019. Corporate and non-corporate businesses deleverage through 2011

Source: BBVA Research

Where does this leave us in terms of the current cycle?

Having identified and validated this sequence of events, we now have a checklist that we can use to assess the conditions in the current credit/business cycle. We find that the current cycle is driven by business leverage and is at an advanced stage. The monetary policy tightening that was implemented by the Federal Reserve in the period between 2015-2019 resulted in market tremors at the end of 2018. The repo market disturbances of 2019 could be another sign of stress in the inner workings of the financial system which are still not well understood. The Federal Reserve ended interest rate hiking at the beginning of 2019. Later in the year, it proceeded to lowering interest rates by 0.75 percentage points. It is now engaged in liquidity provision through the repo market and as a result has reverted to growing its balance sheet. These conditions provide extended monetary accommodation to the economy which should lead to further increases in business sector leverage. Eventually, the market players will be faced with a constraint and a credit crunch either because the Federal Reserve resumes interest rate normalization or because the level of leverage itself reaches a tipping point at which a large number of entities become financially overstretched and riskier so that lenders withhold additional credit after an initial increase in delinquencies on their assets, and thus induce a shock to the credit market. That said, there is nothing which suggests a high likelihood of this occurring in the short term.

Conclusion

Minsky's financial instability hypothesis is a concept that ties together investment, debt, leverage, operating cash flows, interest service costs and asset prices into one consistent model. As such, it explains intuitively the endogenous forces that drive the business cycle. Using this concept, we develop a tool that could be used to assess the evolution of the business cycle as it transitions from expansion to contraction. The tool can provide qualitative information that can complement quantitative assessments of recession probabilities. In this way, we try to shed light on the proverbial cliff that the economy is on – leverage, so that we are better prepared for when it trips over the edge – and lands in a credit crunch.

Appendix – Detailed historiographical chronology of events

Sources: Where not quoted, Federal Reserve official documents (Records of Policy Actions and Minutes of Meetings), Federal Reserve data or FDIC data. Where cited, various papers, articles and news sources. Recession dates as per NBER.

1957-1958

- The early 1950s saw the issuance of the first credit cards and direct lines of consumer credit.
- In December 1954, the FOMC ends its active policy of monetary ease after signs that the economy has started growing again after the 1953-1954 recession
- At the FOMC meeting in March 1955, “concern was indicated with respect to the relaxation of terms for and the volume of expansion in mortgage and consumer credit”
- At the May 1955 meeting, the FOMC noted that “rapid expansion of real estate and consumer loans had continued. This further expansion in the volume of credit and evidences of continued speculative pressures in the stock markets had been followed by action of the Board of Governors increasing margin requirements from 60 to 70 per cent, effective April 23, 1955.”
- In August 1955, the FOMC moves its policy stance from neutral towards one that helps in “restraining inflationary developments in the interest of sustainable economic growth”
- Consumer bankruptcies broke the Depression record in 1955. This supports the hypothesis that excessive lending in the early 50s led to a sort of overheating of consumer markets which compounded the level of financial distress in the household sector (supported by leverage metrics).
- In December 1956, the Treasury securities market becomes strained and the Federal Reserve injects liquidity in the form of “a substantial volume of reserve funds into the market.”
- The bear market of 1956/57 began in a period of weak business profits and increasing bond yields.
- In April 1957, the Treasury Department raises concern about the ability to refinance its debt in an environment where banks are pressed to deleverage by the Federal Reserve
- In the second half of 1957, the economy starts to slow down and in October 1957, the FOMC noted that the “environment for monetary policy was beginning to look quite different from the boom conditions that initially justified the current restrictive policy.”
- The U.S. experiences a period of “tight credit” in the fall of 1957. (Owens & Schreft, 1995)
- Over November and December 1957, the Federal Reserve reduced discount rates from 3.5% to 3%, “to reduce the cost of borrowing from the Reserve Banks and eliminate any undue restraint on bank borrowing in view of the decline in business activity and evidences of economic recession”
- In January 1958, the Federal Reserve dropped the margin requirement to 50%, which coincides with the end of this bear market.

1960-1961

- By mid-1958, the U.S. economy returns to expansion after the Fed manages to restore credit flow into the economy with a combination of rate cuts, reserve requirement reductions and treasury purchases.
- In July 1958, the market for treasuries freezes due to no interest in purchasing relative to a large wave of selling. The Fed is prompted to intervene. Treasury prices fall and yields increase significantly over the summer.
- Monetary policy starts to tighten again in August 1958. The fed funds rate increases by 3 percentage points in the span of less than a year-and-a-half. The stated goal is to constrain “inflationary credit expansion.”
- Depositors withdraw money from depository institutions to purchase treasuries due to interest rate differentials because of deposit interest rate ceilings. This puts in jeopardy of insolvency financial institutions and dependent customers.
- The U.S. experiences a period of “tight credit” in the last third of 1959. (Owens & Schreft, 1995)
- Bank loan growth slows in 4Q59 and 1Q60
- In February 1960, the expectations for vigorous expansion are reevaluated as signs of economic slowdown emerge.
- In April 1960, the Federal Reserve starts monetary easing.
- From April to July 1960, the Fed increases System holdings of Treasuries by a significant amount “to promote further reduction in the net borrowed reserve positions of member banks and, beginning in May, to provide reserves needed for moderate bank credit and monetary expansion.”
- Over the summer of 1960, the Federal Reserve introduces multiple measures to both increase reserves and lower reserve requirements at commercial banks.
- Gold purchases from overseas increase due to downward pressures on the U.S. dollar.
- By October 1960, “both the number of business failures and the total liabilities of failing firms were running at levels close to postwar peaks.”
- At the beginning of 1961, bank loan growth deceleration stops.
- Easing of the monetary policy stance continues until the middle of 1961.
- At the end of 1961, the Fed raises the interest rate ceilings on savings and term bank deposits
- Bank credit expansion starts to accelerate again in 1962.

1969-1970

- After mid-cycle monetary policy easing, the Federal Reserve started tightening monetary policy again in the latter half of 1967 because of concerns about the rapid expansion of bank credit and the money supply.
- Concerns about the U.S. balance of payment emerge as the current account surplus erodes due to the Vietnam War efforts and the increased government spending on social programs, which results in a drain of U.S. gold reserves.
- On January 1, 1968, the President announces a program designed to bring the “balance of payments to--or close to--equilibrium in the year ahead.” (Message to the Nation on the Balance of Payments, 1968)
- Concerns about higher inflation increase.
- Fears of a change in U.S. gold policy spread in international markets.
- British authorities declare a Bank Holiday on the London gold market on March 15, 1968 due to large speculative demands for gold.
- Growth remains strong, but inflation continues to accelerate.
- On June 28, the “Revenue and Expenditure Control Act of 1968” is signed into law with a goal to restrain private and Government spending and dampen inflationary pressures.
- Government spending and subsequently private consumption slows down.
- Towards the end of 1968, commercial bank credit growth acceleration slows but remains positive.
- Monetary policy tightens progressively in response to elevated rates of inflation (over 4%), but in May 1969 signs emerge of stringency in financial markets.
- Runoff of certificates of deposit occurs into short-term Treasury bills and commercial paper. (Silk, 1973)
- Euro-dollar borrowings of U.S. banks increase in response to relatively higher interest rates in the U.S. and the banks’ need to finance lending in the U.S.
- In July 1969, the Federal Reserve amends Regulation D to require Eurodollar transactions to be counted as demand deposits subject to reserve requirements. In August, a 10% marginal reserve requirement on net borrowings of banks from own foreign branches was placed. Also, funds obtained through repo transactions were also made subject to reserve requirements. (Wolfson, 1986)
- While credit demands remain strong over the summer of 1969, banks show some restraint and interest rates increase.
- Borrowing by nonfinancial corporations in the commercial paper market increases to offset the tighter lending standards at commercial banks. (Wolfson, 1986)
- Job growth slows in the second half of 1969.
- Inflation remains relatively high throughout 1970.

- Unemployment starts to increase in January 1970.
- Monetary policy stance starts to ease in February 1970.
- In April and May 1970, concern emerges about a possible liquidity crisis. Interest rates on long-term Treasury, corporate, and municipal securities rise to record highs, in part, according to the FOMC, "because of a heavy volume of offerings in capital markets and perhaps some increase in liquidity preferences". Due to increased market uncertainty, the Fed "supplied reserves through open market operations more readily than it might have done otherwise."
- In May 1970, the FOMC increases liquidity provision in order to restore order in financial markets regardless of ongoing inflationary pressures by purchasing Treasury securities outright as well as and through the repo market.
- In June 1970, the Federal Reserve suspends interest rate ceilings on most time deposits over \$100K with maturities between 30 and 89 days in order to accommodate potentially high credit needs by commercial banks, which would be channeling funds to nonfinancial corporations.
- On June 21, 1970, Pennsylvania Central Railroad files for bankruptcy. "Already swimming in \$200 million of commercial paper, the railroad saw no way to refinance soon-to-mature bonds and commercial paper. Its impending demise roiled financial markets and pummeled the Penn Central's share price. When Commercial Credit and Chrysler Financial, two of the nation's leading credit companies, found it difficult to roll over maturing commercial paper, pressure on the markets became intense." (Kaufman, 2009)
- The stock market continues to decline until July 1970, when it bottoms out at a level about 33% below the prior cyclical peak.
- The economic contraction ends by the middle of the year, but growth does not resume in a consistent manner until 1971.
- In early 1971, the speculative grade bond default rate (trailing 12-month average) reach 12%. (Moody's Investor Service, 1994)
- Nonfinancial corporate businesses levering up ends and slight deleverage sets in.

1973 – 1975

- The economy reverts to expansion in 1971, but the trade balance and possible overvaluation of the U.S. dollar challenges, which had become apparent in 1968 together, intensify.
- REITs continue the fast growth that started in the late 1960s. REITs begin to borrow in the commercial paper market, backing up these borrowings by unused lines of credit at commercial banks. The conditions in the real estate market are conducive to increased growth and leverage for the time being. (Wolfson, 1986)
- The Nixon shock in August 1971 introduces measures that provided grounds for temporary economic stability. Under that program the Commission on Interest and Dividends imposes ceilings on banks' prime rates. (Owens & Schreft, 1995)
- The slow monetary tightening that took place in the first half of 1971 was reversed in the second half of 1971 after the Nixon shock produced a moderating effect on the expansion of the monetary aggregates.

- By the end of 1971, the effects of the Nixon shock were abating, but the Federal Reserve continued to provide accommodation to offset the increasing economic policy uncertainty.
- The Smithsonian Agreement is made in December 1971, whereby the U.S. dollar is devalued relative to the currencies of the other major market economies and the flexibility in the currency exchange rates is increased.
- The Federal Reserve starts slowly tightening financial conditions in March 1972 and continues doing so throughout the year.
- In January 1973, President Nixon proposes extending some of the measures introduced in 1971. Heavy speculative flows out of U.S. dollars and into German Marks force foreign central banks to purchase large amounts of U.S. dollars to maintain the agreed exchange rates at the Smithsonian meeting 1971. Eventually, the U.S. devalues the dollar by 10% in February 1973.
- The stock market begins to fall in January/February and remains on a downward trend until the end of 1974.
- The prime rate ceiling imposed by the Commission on Interest and Dividends makes bank loans more attractive for corporations relative to commercial paper. As demand increases from prime borrowers, bank lending shifts away from non-prime clients. (Owens & Schreft, 1995)
- Banks' commercial loan expansion, already at a record rate in January, rose sharply further in February. A sizable share of the increase in outstanding loans is attributable to a shift in business borrowing from the commercial paper market in response to a rise in short-term interest rates in the market relative to bank lending rates. Loans to foreign commercial banks also expand considerably, and consumer and real estate loans continue to grow at a fast pace. To accommodate the strong loan demand, banks sharply increased the outstanding volume of large-denomination CD's and reduced their holdings of Treasury securities.
- In March 1973, the adjustable currency peg breaks down and is de facto replaced with a regime of managed floating among major currencies (Truman, 2012)
- The Federal Reserve continues to tighten monetary policy as concerns about inflation increase. On May 16, 1973, the Federal Reserve Board votes to suspend interest-rate ceilings on large CDs with maturities of 90 days or more, but increases reserve requirements by 3% to total of 8%. (Wolfson, 1986)
- On June 13 the President announced that prices of all goods and services--except for rents and for prices of raw agricultural commodities sold at the farm level--would be frozen for a period not to exceed 60 days while a new and more effective system of controls was being devised to replace the economic stabilization program's third phase, which had been introduced in mid-January.
- June/July 1973, yields continue to rise with tightening monetary conditions, but bank credit remains consistent with expectations.
- Significant fluctuations occur in the foreign exchange market and the Federal Reserve increases its swap line limits with other central banks to allow for increased maneuvering space of central bank interventions.
- While economic growth slows in the second half of 1973, inflation remains elevated and the Federal Reserve continues to tighten monetary policy. Business loans by banks expand at a rapid pace and prime and CD interest rates increase.

- In September 1973, the FOMC concludes that there should be a pause in monetary tightening, but increases reserve requirements on large CDs from 8% to 11%. Industrial production declines.
- October 1973, credit expansion slows in the previous month to its annual low. US banks continue liquidating large amounts of their government securities for the fourth month in a row. Yields began falling from their annual high just one month before. The committee considers easing in order to sustain moderate growth in monetary aggregates. Arab Oil producing countries hike the price of oil and institute an oil embargo to most Western countries.
- On October 19, the U.S. National Bank of San Diego fails. It is the largest bank insolvency in U.S. history at that time. While fraud was involved, a lot of the bank losses were related to real estate investments.
- November 1973 (start of the recession), the unemployment rate bottoms out. Bank credit did not change from the month before (where it had been slowing) and banks continue to trade their government securities for commercial paper.
- On December 7 the Federal Reserve announces a reduction from 11% to 8% in marginal reserve requirements on large-denomination CD's.
- The FOMC agrees to ease monetary policy stance at its December 17-18 meeting in order to counteract the effects of the global slow-down which was expected with the oil price increases and embargo.
- The REITs crisis comes to the fore with the collapse of the Kassuba Development Corporation, one the largest developers of apartment buildings in the country. About 20 REITs have made loans to Kassuba. As a result, auditors require REITs to increase loan loss provisions and stop counting as income interest payments accrued by not yet received. Commercial paper market closes for most REITs, so they resume borrowing from banks. Many banks already have significant exposure to REITs, so they are incentivized to keep support them. (Wolfson, 1986)
- Bank asset quality deteriorates throughout 1974 and 1975 (Wolfson, 1986)
- By March 1974, it becomes obvious that output is contracting in real terms. The unemployment rate is on an upward trend since October/November of 1973.
- Over March and April 1974, the FOMC starts to tighten financial conditions somewhat in light of the faster than preferred expansion of monetary aggregates. The tightening continues through September 1974.
- In May 1974, press reports emerge of problems experienced by Franklin National Bank and of rumors that other financial institutions might be encountering liquidity and other difficulties, leading to widening spreads between high and lower quality securities.
- Fears of widespread weakness in the financial sector spread, leading to a temporary liquidity crisis. Securities market lenders become more conservative, forcing less creditworthy borrowers out of the credit market. (Owens & Schreft, 1995)
- Tiering develops in the market for large CDs, with wide spreads over Treasury yields, especially for smaller banks. The Eurodollar market becomes stressed with many banks not being able to obtain funds for an extended period of time. (Wolfson, 1986)
- Speculative grade corporate bond default rate (trailing 12-month average) reaches 4% in 1974, up from less than 1% in late 1971

- In July 1974, the growth of loans at U.S. commercial banks moderates.
- Franklin National is bailed out because regulators are worried that with its large foreign exchange portfolio and presence in Eurodollar markets, its failure would risk financial instability in international financial markets. Regulators handled this resolution by having the Federal Reserve Bank of New York acquire Franklin's foreign exchange portfolio and open its discount window (lending up to \$1.7 billion at one point). (Prescott & Nuriso, 2017) In October 1974, the bank is sold to the European-American Bank & Trust Company.
- Starting in September 1974, the FOMC relaxes the monetary policy stance
- On October 8, the President recommends a program to combat inflation and to mitigate the impact of monetary and fiscal restraint on certain sectors of the economy.
- In December 1974, the level of outstanding loans at U.S. commercial banks starts contracting.
- In January 1975, preliminary estimates of the Commerce Department indicated that real output of goods and services had fallen at an annual rate of about 9 per cent in the fourth quarter of 1974, after having declined at an average rate of about 3.5 per cent over the first three quarters of the year.
- On January 20 1975, the Board of Governors announces a reduction in reserve requirements on the net demand deposits of member commercial banks.
- In his State of the Union message on January 15, the President set forth a program of fiscal stimulus, which includes cash refunds of 1974 personal income taxes in two equal instalments--in May and September of that year--and an increase for 1 year in the investment tax credit for businesses and farmers.
- The economic situation continues to remain highly challenging, so monetary easing intensifies over the first quarter of 1975.
- By the start of the second quarter of 1975, signs of deceleration of the downturn emerge. The prospect of an upturn in economic activity has been strengthened by enactment of the Tax Reduction Act of 1975, which will be adding to growth in disposable personal income soon.
- The Federal Reserve ends aggressive monetary easing in April 1975, but remains ready to support the economic recovery that appeared to be in process of developing.
- Corporate, noncorporate businesses and households deleverage starting in early 1975.

1980

- In response to the increase in inflation in 1977, the FOMC started tightening monetary policy in the middle of the year. The Fed Funds rate increases throughout 1978, but inflation does not abate.
- Credit expansion slows progressively over 1978 in real terms.
- Economic growth decelerates sharply at the beginning of 1979. Housing construction, real manufacturing, and trade sales weakened. Business fixed investment and services hold up.
- In October 1979, the Federal Reserve announces a series of complementary actions directed toward assuring better control over the expansion of money and bank credit and toward curbing speculative excesses in commodity and financial markets, including foreign exchange markets. The actions include an increase in Federal Reserve Bank discount rates from 11% to 12%; establishment of a marginal reserve requirement of 8 percent on increases in certain managed liabilities of member banks, Edge corporations, and U.S. agencies and branches of foreign banks; and a shift in the conduct of open market operations to an approach placing greater emphasis in day-to-day operations on the supply of bank reserves and less emphasis on confining short-term fluctuations in the federal funds rate. At its meeting on October 6, the FOMC had decided that over the remainder of 1979, the Manager for Domestic Operations should place primary emphasis on restraining expansion of bank reserves in pursuit of the objective of decelerating growth of M-1, M-2, and M-3.
- November 1979, many economic indicators hold, but industrial production falls and unemployment ticks up. The previous month's actions result in slower acceleration of bank credit. Most yields continue to increase.
- December 1979, the deceleration of the money supply is reversed. Economic indicators continue to stagnate on average. Most yields decline.
- Most monthly macroeconomic indicators decline during the beginning of 1980, hinting at a contraction.
- February 1980 (start of the recession), unemployment ticks up by 0.3pp. There is a general weakening of bank credit extension to non-financial businesses.
- In March 1980, the Federal Reserve imposes credit restraints, causing a 51% drop in total private borrowing. This is in the context of a very hot mortgage market which greatly outpaces the trend set earlier in the decade. The measures eventually are seen as unnecessary as previous tightening had started to produce the desired effect.
- The prime rate reaches 20% after the introduction of the credit restraints. Consumer lending becomes unprofitable for banks, as usury ceilings, limiting the interest rates that could be charged on certain consumer loans, became binding. (Owens & Schreft, 1995)
- By April 1980, the recessionary indicators are obvious.
- The credit controls are lifted in July 1980. "Pent-up demand for credit and an easing of monetary policy that rekindled inflationary expectations pushed interest rates up through the end of 1980." (Owens & Schreft, 1995)
- Households deleverage through the mid-1980s.

1981-1982

- After the first wave of monetary tightening had proved ineffective, the Federal Reserve tries again to combat inflation as they had in the previous year. The Federal Funds rate starts to increase in August 1980.
- In October 1980, the FOMC Record of Policy Action noted “major sources of uncertainty as well as of concern with regard to the business outlook were the continued rapid pace of inflation and the substantial rebound of interest rates so soon after the turnaround in economic activity. In these circumstances, the outlook for consumer spending was very clouded.”
- On December 4 1980, the Board of Governors announced an increase from 12 to 13 % in basic discount rates at Federal Reserve Banks and an increase from 2 to 3 percentage points in the surcharge on frequent borrowings of large institutions. This action exerted additional upward pressure on the federal funds rate; in trading during the morning of December 5, the rate generally was well above 18 percent. Later in December it reached 19.8%.
- In March 1981, production, home sales and employment contract. Economic growth carries over from the previous quarter but the pace of the expansion is slowing in the foreground of increasing inflation. Expansion in total credit slows to half its trending pace.
- In April 1981, the federal funds rate starts to increase again.
- In May 1981, GDP continues to slow with few other indicators of an economic slowdown. Credit issuance continues to slow but not as quickly as it had earlier in the year. Most yield trend downward and credit contracts overall after seeing an uptick from the beginning of the year. Economic growth is predicted to be sluggish for the second half of the year and into 1982.
- By August (beginning of the recession), GDP had contracted in the previous quarter and the effects of the tightening occurring since April are in full effect. The fed funds rate hits over 19%. Total credit expanded in the two preceding months. Yields on long-term securities moved upward to record levels. This upward pressure reflects increased concerns about prospective financing needs of the Treasury in light of legislation to reduce taxes (the Reagan cut).
- The effective federal funds rate declines somewhat between August and December 1980.
- By October 1981, credit continues to expand from its slowdown earlier in the year and includes a rapid expansion in corporate credit offerings.
- By November 1981, the large economic contraction becomes obvious with declining production, payroll and housing. Credit once again slows given economic conditions.
- Inflation declines gradually until mid-1982.
- The federal funds rate falls below 10% for the first time since the middle of 1980.
- Unemployment peaks at 10.8% at the end of the recession in November 1982.
- The deleveraging of the households that started in the midst of the previous recession continues.

1990-1991

- In 1988, growth remains strong, but is slowing in the second half of the year and furthermore in 1989. Inflationary pressures start to increase. The federal funds rate is rising between March 1988-March 1989.
- In February 1989, the deteriorating situation in the S&L industry leads to President Bush unveiling an S&L bailout plan.
- In March 1989, the unemployment rate bottoms out at 5.0%.
- In April 1989, the growth in domestic nonfinancial debt slows.
- Consumer spending starts to decelerate.
- In the middle of 1989, the Federal Reserve starts monetary easing, bringing down the federal funds rate from close to 9% to around 8.25%.
- In August 1989, Financial Institutions Reform Recovery and Enforcement Act (FIRREA) is passed to address the S&L crisis.
- In October 1989, the junk bond market starts to collapse.
- In February 1990, Drexel Burnham Lambert files for bankruptcy protection
- In February 1990, the head of the Office of the Comptroller of the Currency “sent an advisory to the chief executive officers and directors of all national banks, warning them against making imprudent real estate loans.” (Owens & Schreft, 1995)
- Over 1990, the FOMC starts raising concerns about the negative impact of S&L conditions, possible capital rationing and a credit crunch.
- The Federal Reserve starts to ease monetary policy in October 1990.
- GDP growth contracts in the 4Q1990 for the first time since 1982.
- On December 4, the Federal Reserve eliminates reserve requirements on nonperson time deposits and net Eurocurrency liabilities in order to improve banks’ earnings and liquidity. (Owens & Schreft, 1995)
- Credit availability decreases as a result of the crisis, more stringent regulation and weakened capital buffers. Lenders tighten credit standards in response do credit quality deterioration. For detailed explanation on the banking industry conditions see statement of ABA Chief Economist Robert Dugger delivered at a hearing on the credit shortage before the Committee on the Budget, U.S. House of Representatives, November 1991. (Committee on the Budget, 1991)
- Speculative-grade default rate (trailing 12-month average) reaches close to 12% in 1H91 (Moody's Investor Service, 1994). C&I delinquency loan rate at commercial banks reaches 6.8% in 2Q91.
- Nonfinancial corporate businesses deleverage 1991-1993. Nonfinancial noncorporate businesses deleverage 1993-1995. Households deleverage 1992-1993. Private depository institutions deleverage 1991-1997.

2001

- The 1990s are an era of great optimism and excitement around the new technologies that are being commercialized by the ICT industry. The end of the decade sees the dot com bubble. There is a significant buildup of leverage in the nonfinancial corporations sector. The Taxpayer Relief Act of 1997 reduced the capital gains tax rates, which could have served as an additional incentive for households to take on more risk.
- Corporate debt burden peaks in the years leading up to the recession. This burden likely characterizes overinvestments in technology in the late 90s, among other things.
- In September 1998, the Federal Reserve eases its monetary policy stance in the wake of the Asian Financial Crisis and the default of Russia, as well as an increase in anecdotal evidence that the economy is slowing down and showing signs of increased stress in credit markets (primarily increase in spreads), to some extent also influenced by the problems at LTCM that had become apparent and threatened the stability of the financial system.
- By December 1998, at slightly over 4.5%, the federal funds rate stands almost 100 basis points below the level at which it stood in the first half of the year.
- With the concerns about capital markets behind, the FOMC resumes monetary policy tightening in February 1999. The federal funds rate peaks at 6.5% in 3Q00.
- Economic growth moderates in the second half of 2000.
- The outlook deteriorates in early 2000 and in January the FOMC cuts the fed funds rate two times, by 50 basis points each. A contraction in production was the first indicator of a recession. An additional 50 basis point rate cut was implemented in March.
- The NASDAQ composite index peaks in March and subsequently loses a large share of its value.
- In the second half of 2001, the Federal Reserve progressively lowers interest rates. The Federal Funds rate falls over time to 1% in late 2002 and early 2003.
- In November 2000, lower business profitability results in further tighter credit conditions. This contraction was blamed on lender caution and demand-side weakness.
- December 2000, credit terms for business borrowers become stricter resulting in a further tighter credit market. The unemployment rate bottoms out at 3.9%.
- January 2001, the Fed board notes its concern about large corporate investments (and leverage) by technology companies with low profitability but continued growth. The unemployment rate starts increasing.
- March 2001, banks continue to impose tighter credit terms. A significant drop-off in nonfinancial commercial paper and a sharp decline in bank C&I lending ensue and raise concerns about credit availability to business borrowers. (Kwan, 2002)
- May 2001 (start of the recession) credit expands as banks shift their funding from foreign to domestic sources.
- Corporate businesses deleverage through 1994.

2007-2009

- While corporations deleverage after the 2001 recession, households continue to borrow, primarily through mortgage loans and home equity lines of credit. Accommodative monetary policy results in the lowest mortgage rates in over 30 years. Home prices start to accelerate and a mania in the housing market occurs. Credit standards are progressively weakened resulting in a subprime mortgage crisis. Towards the end of the expansion, household debt service burden reaches the levels from the early 1980s when interest rates were significantly higher. The use of complex derivative structures and off-balance sheet accounting has made the financial sector much more fragile.
- In 1Q07, several creditors or holdings with positions in subprime mortgage markets declare losses as a result of excess defaults or declare bankruptcy
- The Federal Reserve lowers the fed funds rate progressively throughout 2007 and 2008 to de facto 0% by the start of 2009.
- In May 2007 the unemployment rate bottoms out at 4.4%
- In 3Q07, foreign institutions with positions in U.S. sub-prime mortgages begin announcing write-offs and bankruptcies. LIBOR reaches a local maximum.
- In 4Q07, large banks (Credit Suisse and Citigroup) begin declaring losses and write-offs as a result of their positions in sub-prime Mortgage Backed Securities. The Federal Reserve as well as other central banks start injecting liquidity in the financial system. The TAF program is instituted.
- The recession starts in December 2007.
- By March 2008, a full-blown liquidity crisis seems to be unfolding and asset prices are collapsing. The TAF program size is increased and the size of interventions in the repo market increases. A new facility is launched, TSLF. Bear Stearns is bailed out.
- In September 2008, Lehman Brothers files for bankruptcy protection. It is the largest bankruptcy in U.S. history.
- In October 2008, Congress passes the TARP program and President Bush signs it into law. The program allows the U.S. Treasury to buy illiquid assets from banks and thus improve their liquidity.
- The recession lasts until mid-2009, but leaves deep scars on the U.S. economy. The unemployment rate peaks at 10% in October 2009.
- Corporate and noncorporate businesses deleverage Households deleverage through 2011. Households continue deleveraging through 2019.

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