

An outlook on crisis indicators than and now

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Abstract: The longest ever bull market in recent history is finally coming to an end as global recession fears have been steeply rising with the global outbreak of the CoVid-19 pandemic. Needless to say, the stage for another global economic downturn has been in the process of setting, the Russian-Saudi-Arabian oil price war, market uncertainty, high volatility and by far most importantly a global pandemic have created a perfect storm triggering a worldwide economic downturn. Could we have predicted the outcomes of the events that led up to the current liquidity crisis? Could economic indicators potentially forecast recessions? If yes, then what are those indicators, and how exactly should average people interpret them?

The research paper is going to focus on gathering a database of all of the possible banking and currency crisis indicators, evaluating their feasibility and, if possible, model their behavior. The contribution of a currency or banking crisis prediction model would be that of an independent forecasting system that would give an estimate of the likelihood of a recession. The research paper analyzes in great detail the timeline of the 2008 financial crisis and the patterns that lead to it, altogether comparing the current financial market's condition to its condition before the last crisis, highlighting similarities and core differences.. The aim of the research paper is to introduce a few key market indicators capable of forecasting major shifts in macroeconomic business cycles introducing the importance of a close attention to the national treasury bond maturity yield curve

Keywords: credit cycle, crisis, yield curve

1. The long and short-term credit cycle

The analysis of big debt cycles begins with its main cause- credit. Since it is regarded as a mean of providing an individual or legal entity with buying power, it is concluded that its direct result is the accumulation of assets and collateral-means of servicing debt. Crediting- getting a loan from a bank, essentially means that whilst the borrower has more money to spend than they make when the loan

is provided, inevitably there will be a time when as a result of servicing the debt the borrower is going to have to spend less than they make. This, in turn, creates what is known as the “short term debt cycle”- a set of logical events reoccurring in predictable patterns in a market-based economy. The “long term” cyclicalities are expressed in the relationship of upward and downward swings of all of the individuals and entities in the economy -debt investors- in a specific point along the curve where a strong growth upswing driven by debt financed investment supporting incomes and asset prices peaks at the instant of maximum public confidence in eternal economic growth just a moment before the downswing occurs driven by accelerating costs of debt service payment, resulting in high accumulation of debt slowing down lending and increasing pressure on debtors, virtually stopping investment, halting income growth and decreasing asset prices. If the swing is too large, the economy might enter a depression. These swings are inevitable and most likely reoccur every decade or so. However if the cycle is paid attention to and nobody is deceived by “easy credit”, if the best arrangements are made from both the sides of businesses, banks and the government, the downfall can be substantially softened by a so called “beautiful deleveraging”- a term coined by Ray Dalio that describes the use of four factors to ease the effects of a recession on the individual and the society as a whole.

It is undeniably to a persons’ and, on a larger scale, to an economies advantage to be able to make large scale purchases and together with that grow in wealth and prosperity. However, as economists and policy makers have learned from experience, providing too much or too little credit really depends on the financial state of the people in the economy. In case credit is easily accessible, meaning interest and financial requirements for its servicing are low, it may result in the formation of bubbles on local and national levels fueled by reckless bank behavior. On the contrary when crediting is restricted, savings go up and people must look for alternative investment opportunities. Consequently, it can be stated that low crediting in the economy is indeed just as, if not more harmful as its abundance.

Much of the responsibility of national credit provision lies on the shoulders of policy makers. They are indeed the ones to boost the economy during slowdowns and pull the breaks on uncontrollable lending. Their importance in handling the situation can’t be overstated. They possess the key to handling debt crisis by implementing the proper policies involving controlling the spread of burdens on financial sectors. Unfortunately, the human factor, prejudice and the ‘end justifying mean’ principle give a tremendous influence on them, most of the policy makers tend to be in favor of “easy credit”, as it is advantageous for their popularity among the people.

“A beautiful deleveraging” provides an alternative to recently used methods like quantitative easing, having questionable influence on the yield curve, for stabilizing the economy with using the levers of austerity (spending less), debt

default (restructuring), monetary policy and transfer of money and credit from the “haves” to the “have nots” in a favorable way.

All in all, it is crucial to understand the credit cycle, as it governs the societies prosperity.

2. An overlook on the 2008 financial crisis

The 2008 financial crisis was undeniably a global economic disaster that resulted in record-high worldwide unemployment, fear, panic, what's outcome was the “Great Recession” and cost millions of people their savings, jobs, their homes and way of life [1]. The crisis was far from being an accident, it was caused by an out of control industry that was fueled by greed and craving for “easy money”.

In order to see what exactly lead to this disaster, it is crucial to understand the structure of the United States banking system after one of the largest economic crashes in history- the “Great Depression”. After this event of a never before seen scale that devastated the American society as a whole, the government, in order to prevent such crises from ever happening again, put tight regulations on financial institutions and kept them under strict control. This, in turn, lead to forty years of economic expansion without any severe downturns. During this expansion commercial banks were local businesses that were tightly regulated and were prohibited from doing any kind of speculative activity, and investment banks, that usually dealt with stocks and bonds, were private partnerships comprised of a few investors.

The last two decades of the past century, however, saw the brink of a long process of government deregulations that essentially became the building blocks for the upcoming crises. It all began in 1980, with Jimmy Carter's Depository institution's deregulation act that broadened the banks' lending powers and introduced new ways for savings and loan associations to provide credit. His successor, Ronald Reagan, famous for his stance in a pro-business market economy liberated from government control and his deep respect towards entrepreneurs, continued and strengthened the deregulation process by an act that provided for adjustable-rate mortgage loans. This was followed by the Gramm-Leach-Bliley act, -a law adopted under the presidency of Bill Clinton, which was a major contributor to the near-crash of the system. It was a turning point in the deregulation process as it repealed the Glass-Steagall Act of the thirties that was imposed solely for the purpose of restricting banks from owning other financial companies. By this act, depository financial institutions, in particular, commercial banks, could directly compete with Wall Street investment banks. This effectively removed the barriers between Wall Street and average banks. Even from that point, the deregulatory activities were far from over yet, as a matter of fact, they became more

progressive, in terms of liberation of business from government control, and simultaneously they became more effective and generally were liked by the society.

The next key step in the process was the ban of regulation of the derivative market- a newly emerged market for complex financial tools enabling speculators to engage in activities with contracts valued according to the performance of the underlying asset or index. This was indeed another crucial element that contributed to the crash. The Commodity Futures legalization act of 2000 finally liberated the speculators from ever owning the underlying entity. Engaging in activities involving derivatives [4] meant that investors could effectively bet on any outcome of any event as long as it was feasible and viable, for instance, day-traders could bet on oil prices, the bankruptcy of companies and even the weather. As we will see later on, the emergence of this market played a paramount role in the formation and expansion of the housing bubble and how it got out of hand so quickly.

With the presidency of G.W Bush came several acts facilitating the deregulation of the financial sector. One of the most influential laws concerned the ease of net capital rule requirements by the Securities and Exchange Commission, which basically meant that banks were allowed to increase the percentage of outstanding debt.

The whole procedure of deregulation resulted in the fact that practically all of the banks became highly leveraged⁹ on debt. Whereas it was quite uncommon to see leverage ratios of 1:4 before the deregulation process, ratios ranging from 1:20 – 1:33 were incredibly common during the expansion before the crash. Indebtedness became a major factor in the economy from that point. That meant that if the banks' assets were to reduce in value by only 3 percent- than that would be the end of it!

In 2001 two major events struck the economy. The nine-eleven terrorist attacks and the collapse of the internet bubble. The dot com bubble burst to expose the country to a short period of recession. As a natural move from the side of the government, interest rates had to be lowered to encourage people to take credit and by this boost the economy once again. In December 2001, Alan Greenspan, one of the architects of the crisis, former federal reserve chairman under three presidents, lowered the fed funds rate to 1.75 percent, from a staggering 6.5, which was followed by another lowering to 1.24 percent. By 2003 the interest rate was 1 percent. The government also lowered interest rates on adjustable-rate mortgages. Many people who couldn't afford to buy homes were extremely pleased about that. Subprime lending became the so-called "bread and butter" of the banks.

⁹ The ratio between the banks borrowed and the banks owned capital

The financial crisis was preceded by a never before witnessed boom in the housing market. It created one of the biggest asset bubbles in history. According to some resources, the prices of average American homes rose by a staggering 124 percent in a mere decade from 1998 to 2006. However, in order to perceive the true size of the bubble, it is essential to understand how securitization works.

In 1977 Lewis Ranieri, a former bond trader and banker introduced a new innovative way of spreading risk in the lending sector. Before securitization banks were incredibly careful in picking the people to lend their money to, this, in turn, resulted in the banks disability to hold too many mortgages at once, due to regulations from the government on the amount of obligatory net capital that had to remain and the urge to writing off already existing loans was impossible to fulfil, as these loans had maturities ranging from a couple to over thirty years. A new product had to be invented in order to sustain fast economic growth altogether with supporting innovative activities in the financial sector. This product was the Mortgage-Backed Security- a type of asset-backed security that heavily relied on the underlying mortgage payments and used the asset as collateral. The idea behind it was relatively simple. It basically took the load and the risk off from mortgage issuing financial entities and distributed it along with other depository and non-depository financial institutions. When an individual (consumer) wanted to buy a house, they usually took a mortgage, that was granted only after the bank was sure enough that the specific requirements concerning financial stability were met. Such requirements included the review of FICO scores (credit scores), income verification, number of people living in the household, risk of default, assessment of collateral, etc. Risk assessment was crucial. However, instead of these mortgages laying on the books of the loan issuing entity, waiting for decades to be written off, they were instead bundled together and sold as a whole to an investment bank, where investors essentially purchased them and received periodic payments, just like bond coupon payments. It was quite obvious that any mortgage-backed security was only as good as the mortgage that backed it up! The innovation lied in the fact that since these mortgages were bundled together, the risk was relatively low, the argument for the matter was that there were very few people who weren't financially stable enough to pay their mortgages, due to the regulations still being strict on lending activities.

During the boom, the bundling of mortgages was generally dealt with by hedge funds¹⁰[6] and investment banks. These mortgages were often combined with student loans, car loans and similar types of credit. The financial entities would then use sophisticated computer models to price the bundles accordingly. The criteria upon which the bundles worth was determined included monthly payment amounts, future prices, the likelihood of future payment. The bundles were

¹⁰ An investment fund that pools capital from accredited investors and protects it from market uncertainty

evaluated by rating agencies according to their default risks. Triple A rated bundles meant that they were essentially risk-free since they were getting paid first and consequently their yield was low. Double B's and B's were considered mid to low-tier investments. As their payments were questionable, it meant that they were taking on defaults first. The risk was high, and so was the yield.

The investors, however, didn't worry about risk too much as their financial products were insured by insurance companies like the American International Group, a company that was deemed too big to fail in September of 2008 and had to be rescued by taxpayer money

Since the banks already retrieved the values of mortgages, they were able to issue new loans to new clients essentially initiating the period of reckless lending activities that would later produce devastation to the American society.

The system was a ticking time bomb, soon, lenders didn't consider if the borrower was able to repay the loan, and they started making more and riskier loans, knowing that they could balance their books virtually instantly as the investment bank bought the mortgages. Investment banks, having borrowed billions of dollars for purchasing these assets, didn't care either, since their primary source of profit was bundling up and selling these risky assets to investors. The more assets they sold, the more money they made. Investors, on the other side, paid monthly premiums for insurance companies in exchange for credit default swaps [10]. These complex financial instruments were, in fact, derivatives, as, by definition, their value was determined by the performance of the underlying asset. The asset, in this case, was the mortgage bond [9] and its performance depended on the simple act of its monthly payment. In other words, credit default swaps were practically insurances on the bond, meaning if the bonds failed, the value of the asset would be repaid altogether with the collateral the underlying asset held, therefore the investors felt confident in their investment. And finally, insurance companies didn't care either because they were getting extremely wealthy from the monthly payments. It was a self-reinforcing system. The securitization chain was now complete and from that point on a credit crunch was practically imminent. Between 2000 and 2003 the number of mortgages issued on an annual basis grew from a value of 1 billion to 4 billion dollars. What exactly was backed by the MBS bond was now irrelevant. All of the institutions focused on the volume and fees they were getting from operation costs. Needless to say, many bankers became extremely wealthy during the years of the boom. Annual cash bonuses spiked. By 2006 40 percent of all profits of S&P500 firms were comprised of financial institutions.

Bankers were getting huge bonuses on a monthly basis for selling credit default swaps. People were essentially getting paid for taking on unnecessary risks. It was a completely distorted system of compensation.

The peak of the financial system's fraudulence, however, wasn't even in sight.

As previously mentioned, low-tier mortgage-backed securities, labeled as B's and double B's were considered to be high yielding risky assets that were purchased generally for speculative activity primarily by hedge funds. This, naturally, created a problem for market coverage, as not everyone was interested in buying such assets. Investors favored the highest triple-A bonds, whereas hedge funds weren't minding additional risk in exchange for high yields buying tranches of double B's and B's. As a consequence, investment banks wanted to cover both the high yield-high risk and low yield-low risk markets such as pension funds and retirement savings, so they have created a brilliant system of capital flow. This introduced the root cause of the financial crisis: Collateralized Debt Obligations, which are financial instruments that are used to package different types of loans according to their risk factor. Before the brink of the millennium, these financial products have earned the reputation of being safe and sound, primarily due to their diversification in terms of underlying assets which included home loans, car loans, and credit card loans. CDO managers would select the securities that go into the portfolio and monitor the assets. As mortgage-backed securities, they are sold in tranches varying from the riskiest to the safest. However, with the housing bubble pursuing financial institutions to give out riskier and riskier loans, soon enough Collateralized Debt Obligations were primarily comprised of one asset- houses. During the bubble, Collateralized Debt Obligations usually operated with B and double B level assets.

The novelty of CDO's lies in the fact that instead of bonds, deemed too risky to buy (represented by the double B and B level tranches), being warehoused on the books due to low demand on financial markets, they are instead repackaged with a number of similar low-tier high-risk assets including mortgage-backed securities and other loans, which, by the way, are customizable, and put into a tranche similar to that of an MBS*, and being given ratings as if they were solid as treasury bonds, receiving triple-A and Double-A ratings. Some of the CDO's were packaged in a way so that they were on top of each other, CDO of a CDO- hence CDO squared.

According to rating agencies, such ratings were justified due to the inherent diversity of the underlying assets. Many people today speculate that the rating agencies themselves were asked to rate these toxic CDO's and were threatened with competition, meaning that if one credit rating agency didn't provide the financial entity with the credit rating it wanted, then this entity would head over to the competitors.

It must also be noted that there was more to Credit Default Swaps than it would first seem. Essentially, since they were a derivative driven market, they added a certain amount of risk in the initial MBS* and actually exposed its value to market fluctuations and relatively high uncertainty. Using the simplified argument that these products were insurances on the bond, it can be stated in an example, that a house, for instance, can be insured only once by a person who owns the entity itself, however, now that we take into consideration the function of derivatives,

practically anyone can ensure the house. This, of course, as a result of the deregulation process in the late nineties. This effectively meant that in case anything was to happen to the underlying asset, the number of losses in the system would become proportionately larger. The credit default swaps weren't regulated, since they were derivatives, and insurance companies weren't bothering to put aside any capital to cover the losses in case they defaulted. This key factor indeed determined the tragic outcome of the crisis. According to some research, the estimated value of outstanding credit default swaps was 42.6 trillion dollars! An Unimaginable number compared to the 18,5 trillion-dollar evaluation of the whole U.S stock market and Treasuries market valued at around 4 and a half-trillion dollars.

Put in perspective, when considering not only a single house, but hundreds of thousands of households and hundreds of thousands of mortgages, packaged into mortgage-backed securities and collateralized debt obligations, credit default swaps meant that the insurance companies were essentially giving instruments for betting on whether people would be able to make the payments on a regular basis or not. What the insurance companies did not know, or at least, did not want to know at the time, were the actual contents of the mortgages and the incredible high risks involved. Investors, on the contrary, didn't know who they were betting against? But it turns out that they never had to, since credit rating agencies like Standard and Poor's and Moody's and Fitch gave supreme ratings to basically all of the tranches, for an appropriate fee.

But if that wasn't enough, speculators on the side of Wall Street, also wanted in on the game, so they made so-called "side bets" on whether the mortgage-backed securities and CDO's would be making payments on time. These side bets were also made in reference to whether an MBS or CDO would default or not. These side bets were called a Synthetic Collateralized debt obligation [11]. An example to that would be a pool of 10 million dollars, which is chosen because it is meant to represent a single mortgage bond comprised of thousands and thousands of mortgages. The initial investor, who would be receiving monthly payments could, however as he took these assets public, they suddenly became accessible to speculate upon.

As the bubble expanded, CDO's became an essential part of any investors' portfolio. However, investors, altogether with speculators realized that creating and further customizing these CDO's is not as easy as simply using credit default swaps and other derivatives to obtain investment goals- the precise description of SDO's*. Hence Synthetic CDO's became a major player in the near fall of the system. The true danger of derivative markets was in their inherent instability, complexity, unpredictability, and impossibility to assess their value. It is said that the market size for derivatives such as credit default swaps, used to insure mortgages with, was at least twenty times the size of the market for actual mortgages. It was a phenomenal number. It practically meant that if default rates go up to at least 8 percent, the whole financial system would imminently collapse.

By the time synthetic CDO's became a large player in the markets, default rates were as high as four percent and rising. Synthetic insurance jumped from a market estimate of about 15 billion dollars in 2005 to a mind-blowing 61-billion-dollar market in 2006.

At the time, it was quite obvious for many economists that the three main aspects of a bubble were present: there was a new paradigm (new innovative financial instruments to deal with assets, with advantages in terms of deregulation), high engagement (everyone from the side of homeowners and investors wanted to get in on the craze) and asset prices became disproportionately high and highly volatile in the short run. Some of them predicted a mere, correction some predicted an economic slowdown, however, there were very few who actually saw the upcoming crisis [5].

Subprime and Predatory lending became a major issue during those times. Commercial banks and mortgage brokers were targeting practically everyone, and they rarely declined potential borrowers. There were generally two available options for mortgage provision: fixed-rate mortgages and adjustable-rate mortgages. The difference between the two was that while fixed-rate mortgages didn't change in interest, were more expensive and required a larger down payment, adjustable-rate mortgages differed in price, as the down payment had to be significantly less, and were subdue interest rate changes, meaning that if interest went up, the amount of payment also had to go up. Investment banks preferred subprime adjustable mortgages as they brought the most interest.

There were some consumers, however, who managed to bring out a profit out of the housing boom. Since house prices were skyrocketing during the boom, borrowers accumulated more and more equity in their assets. The equity could be liquidated, and it became capital. This capital could be manipulated so that it could be borrowed against fuelling the lending activities of the bank. In most of the cases, the built-up equity was used as a second mortgage on another home due to the fact that people were sure that home prices would never fall down.

The more and more people started defaulting on their mortgages, the more toxic and worthless the CDO's had become. Once the borrowers defaulted on their mortgages, the house, which was now owned by the investment bank had to be foreclosed. The asset turned into collateral, which on a large scale didn't seem to pose any kind of problem. However, as more and more of the monthly payments turned from assets into collateral, the number of houses for sale on the market created a bigger supply than demand, which meant that home prices started to fall! This created a complicated situation for homeowners who were still paying their mortgages. As the houses in their neighbourhood were foreclosed due to the owners' inability to service the debt, their prices fell drastically, and so did the prices of the houses of the people who were still paying their mortgages. Having realized that they were paying disproportionately high amounts relative to the actual price of the house, which was in a dramatic decline, the owners decided to

simply forsake the house. Prices across the nation plummeted and at that point, the investment banker was holding piles of worthless credit as they would never be repaid. The tragedy of the matter is that collateral won't save the investment bank, as it is too, is worthless. Investors now are trying to get rid of these toxic assets themselves, so investment banks can't sell to them. Insurance companies are now on the hook because of the money they owe due to their credit default swaps issued to investors. The chain of the disaster was now complete. The bubble burst! Panic and fear of a global recession spread over Wall Street. Naturally, the whole process was far from being instantaneous. It was a long and devastating year until the first investment bank, at the time the biggest in America, Lehman Brothers, having failed to negotiate a merger or a compromise with any other financial entity, filed for bankruptcy in the month of September 2008. That day Dow Jones industrial average experienced the biggest drop of over 500 points. The failure of an investment bank with an over 150-year history once deemed Too Big To Fail, having earned the respect and trust of generations of investors, sent a major warning to other banks that if they don't act now, they will face the fate of Lehman Brothers. The day after Lehman filed for bankruptcy, AIG was bailed out for 85 billion dollars by the Federal reserve, effectively taking ownership of the insurance bank giant. On the 17th of September 2008, the economy almost collapsed, when investors withdrew 144.5 billion dollars from their money market accounts. Investors were moving funds into U.S treasuries under negative rates essentially not caring if they made a loss, their primary objective was to save as much capital as they could. Banks didn't have enough capital to continue their day to day operations. If this were to continue, shippers wouldn't have the cash to deliver food to grocery stores. On the 21st of September Morgan Stanley and Goldman Sachs agreed to become commercial banks under the Fed's protection. The darkest day of the crash was the 29th of September when a bill was voted down for the bailout bill, due to fears that it was a bailing of Wall Street out of taxpayer's pockets. What the house of representatives didn't realize, however, that the whole global economy was at stake. That day Dow fell 777.68 points. In one day the MSCI* world index fell by 6 percent. It was described by many as a market massacre!

The crash continued on for a month. It all ended with the government stepping in with a troubled asset relief program, where at the expense of taxpayer money, toxic assets such as CDO's and MBS's were purchased, effectively injecting cash into banks [2].

It was undeniably a massive crash. The estimated cost to the U.S economy was 22 trillion dollars, to an average person-70 000 dollar of their lifetime savings.

A natural question arises from all of these events. Have we actually learned something from experience? Will the next expansion last at least as long as the previous one, and can we actually postpone a crisis from happening?

3. Indicators of crises

To answer the questions asked in the previous chapter, it is necessary to examine some vital macroeconomic indicators, in particular, charts just before the crash. The first thing to look at would be the simple supply-demand relationship of the so called “hottest asset” of the decade- houses. It is quite an important thing to understand what exactly drove supply and demand, since even having done no research at all about mortgage backed [8] securities, CDO’s, CDS’s or any other derivatives or obligations, at it late stages, particularly in 2005-2006, it was quite obvious that, unlike what government officials have said, the housing market was indeed in a bubble. And since the burst of bubbles tend to be the main triggers of recessions...However it’s not easy to blame the consumers and their lack of understanding of the market at that time. After all, as mentioned previously, the period from 2005 and 2006 was indeed the zenith of the larger “debt cycle” defined by Ray Dalio as the moment of maximum public confidence in eternal and unstoppable economic growth and reckless debt financed investment. Behavioral economics, a newly discovered field in those times, revealed that even though some people subconsciously really did expect a crash to happen, practically everyone underestimated its severity and timing. In short, whenever there is a sudden and significantly disproportionate change of the ratio of supply and demand of a debt financed overvalued asset, typically within days or weeks (depending on the asset), it is generally said that at that particular moment the bubble that has formed has begun bursting. Now whether this burst would end up in a recession or not, is a question that is answered by the exposure of depository and non-depository financial institutions to the extent of the asset bubble. In the case of the 2008 crash, there were two very simple questions, one of which could be answered practically immediately: “is there a housing bubble?” and “how exposed are the banks”. And by “banks” I generally mean financial institutions that have financed the acquisition of the assets, or have generally interacted with it in any way, such interactions include creating financial tools to trade with derivatives of the underlying asset, engaging in fraudulent activity involving bribes, reckless lending and so on. Drastic declines in the value of the asset that has undergone a burst, are usually proceeded with so called “market ripples”, which can to some extent be interpreted as “aftershocks” depending on the level of exposure of other companies [7].

However, as seen on the graph below, an interesting pattern occurs between the supply of a particular asset and periods of recessions. It turns out that whenever there is a significant oversupply of houses on the market, a recession occurs. The same can be said of vehicle sales to the non-business private sector.



Figure 17: Monthly supply of houses in the United States

Source: U.S. Census Bureau and U.S. Department of Housing and Urban Development, Monthly Supply of Houses in the United States [MSACSR], retrieved from FRED, Federal Reserve Bank of St. Louis; <https://fred.stlouisfed.org/series/MSACSR>, November 16, 2019.

First of all, there is a very good reason why these particular products tend to predict, or, at least, state that the economy is in a recession better than others. These are exclusively debt financed products, meaning that they are very closely connected to the supply and demand for credit and interest rates, consequently taking on defaults first. To understand the connection between recessions and homes, it must be noted that in the case of the graph, the supply ratio, which is the ratio of the houses for sale vs the houses sold is expressed. It is generally argued that the reason for the oversupply of such particular debt-financed assets is, naturally, the larger credit cycle. However, the story is a bit different in case the asset is overvalued to a level of when it itself becomes a bubble. As the consumers, who were lured by banks into buying homes with low down payments, absence of income verification, people living in the household and similar crucial information, have started to default on their monthly mortgage payments, due to the sudden spike in interest rates (since most of the people had adjustable rate mortgages), they were evicted from their houses, essentially becoming homeless, or in need of shelter. The house got under the possession of the investor. It wasn't such a big deal when only a couple of households defaulted. However, such defaults became more and more frequent, more and more people became evicted from their homes and it created a large supply of houses that drove their price down, since at the time, no one was willing to buy. The situation was similar with the automotive industry. The prices for other goods weren't affected up until the government announced that there was a chance of a recession in 2009, when the housing bubble had already burst and there was already a gigantic oversupply.

This example shows once more that debt financed products are the ones taking on defaults first, establishing the first cue that a recession is just around around the corner.

Today it is clear that while housing in European capital cities continues to become more expensive and unaffordable, many are choosing an alternative to buying homes. Renting real estate has become ever so popular in the past years, this, naturally moves the demand for new house down. That is precisely the case Budapest. Most of the housing demand in Budapest is expressed as demand for second hand homes. With price increases of up to 20% annually, demand for new homes is driven down. While the demand around the country continues to increase, more and more new homes are built each year, effectively increasing its prices. As a matter of fact, house prices have begun growing since the provision of the government subsidiary program for young families in 2013. In 2018 the annual change in house prices compared to 2017 was 18,26%, according to FHB bank. So far, supply seems to meet demand, meaning in Hungary the housing market shows no signs of a recession, however it is yet unclear if the trend will remain unaffected by the global economic slowdown developed countries are facing nowadays. It can be stated that nowadays the average Hungarian consumer is generally well off. The Hungarian consumer price index is at its highest, people are encouraged to spend more and save less, foreign investors look at the Hungarian economy as a source of income with one of the highest interest rates in Europe, therefore they are encouraged to lend money in the form of buying government bonds- one of the most popular passive investment tools on the market that is heavily promoted not only to rich investors, but also to everyday people. People are essentially building confidence in the Hungarian economy, which is frankly, not an easy thing to do as the fears of the ongoing manufacturing recession spreading out to the global economy, which, in many economists' opinion, is imminent.

However, initially proposed by Warren Buffet, the market capitalization and GDP ratio can indeed serve as a better, more transparent reliable and easily accessible source for a base of large-scale macroeconomic predictions [3]. It basically estimates the over or undervaluation of a certain market. As of today, the market is significantly overvalued. Basically, there is a market index called Wilshire 5000 that is a market capitalization-weighted index of 6700 publicly traded companies who's headquartered in the United States, traded on the American stock exchange, and what's pricing information is available to the public. To estimate whether the market is overvalued or not we simply divide the index, which is now 30 trillion dollars over the total GDP of the United States, at the moment of writing this article is 20 trillion dollars and we get a number of 146%. This means that the total market index is 146 percent of the last reported GDP. However, another interesting pattern emerges when looked at the historical data of such ratios. Whenever the market cap and GDP ratios were over 100%, a recession would follow.

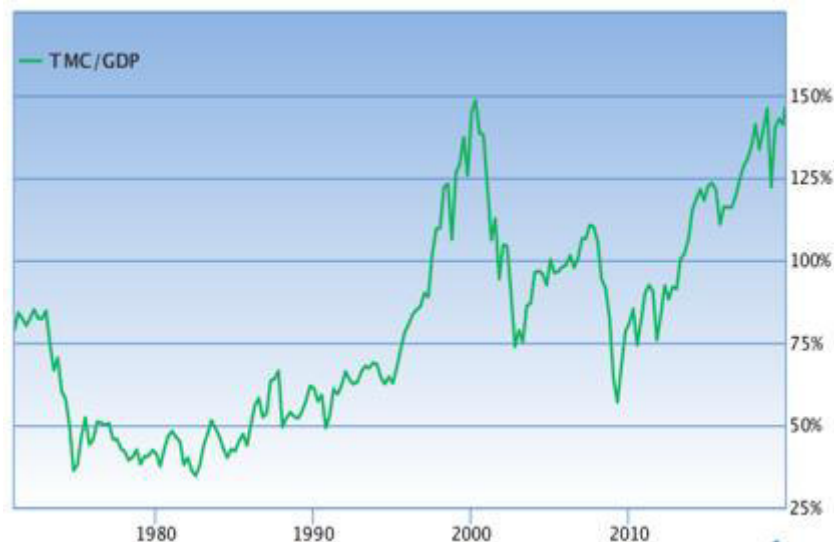


Figure 18: The Ratio of Total Market Cap to US GDP

Source: GuruFocus, interactive chart, 2019.11.16

It is clearly observed on the graph above that the most recognizable 2001 dot com bubble and the 2008 crashes happened when the market capitalization to GDP ratios were over 100 percent. It is also important to note that interest rates play the leading role in determining the total market cap and GDP ratios. Having reviewed both of the charts, it becomes evident that Interest rates are indeed inversely related to the spikes in the total market capitalization to GDP ratio. It may be quite confusing at first, however it is based on a simple fact. Investors are generally interested in the returns they would get on an investment. When spending huge amounts of money, investors have generally two choices: to spend their money on risk free low yielding assets such as government treasury bonds, or similar securities insured by the US government, or they can invest in riskier assets such as stocks or engage in business activities. However, the outcome of their decision will be based on the interest rates. Whenever interest rates are low, the investor is more likely to abstain from buying government bonds as their rate of return isn't as high as that of stocks, so the investor buys stocks, thus increasing market capitalization of the given company and simultaneously increasing the ratio of the total market capitalization to GDP. Conversely, when interest rates are high, the investor will more likely invest in bonds, as it is unprofitable for him to take out loans or buy stocks, as he views it as a certainty that bonds will simply bring him more profit. As in the previous example, the role of interest rates provides a short cut to credit- the main culprit of recession, thus any activity done by the investor will undoubtedly contribute to the long-term debt cycle, thus directly affecting the ability to predict recessions. That is the key element.



Figure 19: Federal Funds rate

Source: GuruFocus, interactive chart, 2019.11.16

In the modern-day economy, thanks to the more liberalized economic system, practically anybody can picture themselves in the place of the investor. For the first time in history interest rates around Europe have surpassed the 0 percent going deep into negative territories. It is now ineffective to lend your money to the government, as you would effectively get back less. Negative interest rates practically mean that investors would have to pay to the bond issuing entity for lending their own money, for instance. At first it seems counterintuitive and confusing but many regards this as an incredibly strong stimulus for consumers to engage in buying marketable debt, or in other words, get credit. After all, if we examine the situation from the side of the banks, it is obvious that... Some call interest rates a weapon of mass destruction, whereas some call it a necessary action to boost the economy. The only visible outcome of negative, or incredibly low interest rates is that they undeniably affect the market capitalization of companies, as investors are drawn to getting more and more credit and invest in the stock market. The federal reserve has kept a steady interest rate of 0% for nearly a decade before it started increasing them as global oil prices fell in 2015. This, in turn created an “opportunity window” for many investors to buy stocks and increase the leverage ratios of the economy. It can be stated that the economy is highly leveraged, which gives off warnings for the society that a recession is indeed on the corner.

The major disadvantage of both of the previously mentioned methods of recession indication is that they don't set a specific timeframe within which a recession is imminent. In other words, using the example of the so called "warren buffet index", even though we know that the economy is highly leveraged, we don't know when will the United States enter into a recession and how big the overvaluation must be for it to give irreparable effects. We also don't know whether there is some correlation between the percentage of overvaluation and the severity of the proceeding recession. As far as we can tell we now know that the proper question to ask is not "if there is going to be a recession" but "when is there going to be a recession".

Among the most popular indicators that have proven to be credible due to careful analysis, one can point out confidence indexes, which are based on subjective thought on how well the country is doing both politically and economically. The index basically tells how people feel concerning their own wellbeing, how confident are they in the future geopolitical relationships. An example of some of the things that the modern economy must be aware of nowadays is the so called "trade war" between the two leading global economies the USA and China. The federal reserve recession probability model is also thought to be a credible source of a recession indicator chart, where based on the spread of the 10-year and three month U.S Treasury yields.

At this point I would like to introduce perhaps one of the most important and most credible sources of crisis indication.

3. Conclusion

It took the global economy roughly half a decade to return to pre-crisis growth rates. It was, however in some ways, a very different world financiers found themselves back in 2008. In a world of a technological revolution, lightning fast trading algorithms and ever complicated financial products, always changing financial deregulatory policies and most importantly, greed, history is the only thing that stays constant. Many of the hallmarks of crises have been spotted well before the current coronavirus crisis, like yield curve inversions, high market to gdp valuations, high debt levels. But in reality, just like 10 years ago, very few people actually saw that the only thing standing between them and a crisis was a mere push.

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