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# Capitalism is the basis of the financial crisis, how we can forecast the advent of the crisis and its relationship with interest-based debt, and if the crypto money and The New Tech will be the trigger of the new crisis?

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**Abstract:**

Financial crisis broadly refers to disruptions in financial markets causing constraint to the flow of credit to families and businesses and consequently having adverse effect on the real economy of goods and services. The term is generally used to describe a variety of situations in which investors unexpectedly lose substantial amount of their investments, and financial institutions suddenly lose significant proportion of their value. Financial crises include, among others, stock market crashes, financial bubbles, currency crises, and sovereign defaults.

Causes and consequences of financial crisis financial bubbles are generally linked to easy credit, excessive debt, speculation, greed, fraud, and corruption. Easy credit leads to lack of adequate market discipline, which in turn instigates excessive and imprudent lending.
Are all these things the consequences of capitalism, where the profit from the interest rate and debt is the most wanted?

**Keywords**: Financial crisis, Bubble, Private debt, interest rate, Capitalism.

## 1. Introduction:

The origins of capitalism vary according to economists and thinkers.The roots of capitalism, according to economists like Karl Marx and Robert Brenner, go back to the 18th century in England. Currently, the importance of wage labor is emphasized in the emergence of this economic system. It is a pivotal moment when England experiences an influx of wealth due to the colonization of America and Africa, leading to a redistribution of land and resources.

Independent peasants are forced to work in factories under horrible working conditions. Peasants, who once lived relatively autonomously, find themselves stripped of their lands and sheep

farming in favor of the textile industry. This creates an increased need for labor in factories. The new work system is marked by individuals' dependence on private owners, signaling the start of wage labor, where workers no longer have independence over the means of production.

The essence of capitalism is the pursuit of profit. According to Adam Smith, often regarded as the father of capitalism, the economy is based on free competition and the pursuit of profit by individuals. This economic model is founded on the idea that exchanges are based on personal interests. Private property is a key principle, allowing individuals to own goods and assets, whether they are houses, factories, or shares.

A market is an economic environment where transactions take place. The market is defined as the environment in which the nodes of the economy interact to make transactions. It is within this framework that the value of goods and services is determined. Prices are dynamic, fluctuating based on supply and demand. For instance, if a product becomes highly sought after, its price increases, while if there is an oversupply, its price tends to decrease.

The capitalist economy requires employees to be paid less than the true value of their work. In a capitalist system, living labor is a combination of the labor value embodied and different labor. This approach allows the total value of a product to be determined.

The employer invests resources to create a product, such as buying a computer for an IT company. This initial cost is crucial for the business's operation.

Employees also contribute to the product's value; without their work, the employer could not produce goods. For example, for a product valued at 200, the employer must recoup a certain amount to continue production.
Simplified, if employees receive less than the value of their contribution, the surplus becomes the employer's profit. This means that employees are generally not paid the full value of their added worth, fueling the employer's profitability.

In a capitalist economy, the profit almost always goes to the employer rather than the workers. In a typical scenario, an employer may pocket most profits, with workers receiving only a fraction of their value contribution.

Employers often argue that the risks they take justify their profit. Indeed, workers benefit from a guaranteed salary, while employers invest in resources with uncertainty about success. In a system where profit is the primary goal, workers are often at a financial disadvantage, which questions the fairness of the compensation system.

In a socialist economy, the profits are collective and not marginal for the employer. In a socialist economy, while the value added by labor is still present, the profits generated are directed towards the workers collectively.

This changes the motivation dynamics for investment, as the goal in a socialist economy is to provide products and services that improve people's lives, rather than generating individual profits. The profits earned are used to pay employees and maintain the business, with the idea that the common good prevails over the personal accumulation of wealth.

There are only companies that produce things people want or needs they manage to create. Successful companies are typically those that meet existing needs or create desires in consumers. Even though some manage to generate new needs, as demonstrated by video game platforms like Steam. Innovation is therefore a key driver for economic success.

Inequality is tolerable for the poor, because they have a chance to become rich.In a capitalist society, inequalities are often justified by the concept of meritocracy, where success is attributed to individual efforts. However, this simplistic view overlooks the numerous obstacles that can prevent even hard-working individuals from succeeding, highlighting the limits of meritocracy.

The problem is that the trickle-down theory has never really been observed. The trickle-down theory, which assumes that the wealth of the rich will eventually benefit the poor, remains contested. Research has shown no direct link between tax cuts for the wealthy and economic growth benefiting everyone, pointing out flaws in the current economic system.

The market accommodates it, as evidenced by the collapse of a building in Bangladesh in 2013. Abuses within the capitalist framework often manifest in the exploitation of workers and resources. Tragedies, such as the collapse of buildings housing factories, show how the pursuit of profits can lead to inhumane working conditions with no regard for human life.

Capitalism is an economic system in which the means of production are privately owned, and markets are used to allocate resources, goods, and services. It is defined by the following core principles:

1. Private Ownership: Individuals and businesses own property, assets, and resources such as factories, land, and capital (money and tools used to produce goods and services).

Owners make decisions about how to use these resources to generate profit.

2. Market Economy: The production and pricing of goods and services are determined by supply and demand in free markets.

Buyers and sellers voluntarily exchange goods and services based on their own needs and preferences.

3. Profit Motive: The primary goal of businesses in a capitalist system is to generate profit.

Profit serves as an incentive for innovation, efficiency, and risk-taking.

4. Competition: Businesses compete with one another to attract customers and achieve success.

Competition often leads to innovation, improved products, and lower prices for consumers.

5. Minimal Government Intervention: In its pure form, capitalism operates with limited government interference.

However, in most modern capitalist systems, governments regulate certain aspects of the economy to address issues like monopolies, labor rights, and environmental protection.

6. Wage Labor: Workers sell their labor to employers in exchange for wages.

Most modern economies are mixed economies, blending capitalism with some level of government intervention to address its shortcomings. Examples include social democracies like those in Scandinavia, where free markets coexist with robust social welfare systems.

Capitalism remains one of the dominant economic systems globally, shaping much of modern society's economic and social structures.

**1.The 1929 Crisis and Its Lessons:**

The 1929 crisis is often symbolized by the Wall Street stock market crash. However, the severity of the crash is not what makes this crisis unique: the drop in stock prices in October 1929 had been surpassed both before and since. What sets the 1930s apart is that the financial crisis was followed by a recession that worsened over several years, culminating in the unique phenomenon of a "Great Depression" lasting nearly a decade. This global depression, unprecedented in scale (with a one-third decline in global industrial production), raises the question: Was it primarily the consequence of a financial crisis, or do other explanations play a more significant role?

We will attempt to answer this question, as the conclusions drawn from this period depend on it. First, we will examine the American financial crisis at the heart of the Depression. We will then seek to nuance the central role of the financial crisis in the fatal chain of events from 1929 to 1933 by exploring the non-financial causes of the Depression and highlighting the specific international conditions that triggered it. Along the way, we will show the lessons learned from the crisis and assess their relevance today.

**1.1 Key Concepts Related to the Stock Market:**

**Stock Exchange (Financial Market):** A marketplace where securities such as stocks and bonds are traded.
Examples: Wall Street (New York Stock Exchange), Nasdaq, Tokyo Stock Exchange, London Stock Exchange.

**Stock:** A share representing ownership of a portion of a company's capital, entitling the holder to dividends (a share of the company's profits).

**Speculation:** The practice of buying a stock or security with the aim of selling it later at a higher price to generate profit.

**Stock Market Index:** A measure that tracks the performance of a group of companies by measuring their market capitalization.

Examples: Dow Jones Industrial Average, CAC40, DAX.

**Stock Market Crash:** A sudden and significant drop in the value of securities listed on a stock exchange, resulting in a sharp decline in market indices.

### 1.2 Genesis and Development of the 1929 Economic Crisis:

Before analyzing the origins of the crisis, it is essential to understand the context in which the U.S. economy evolved before its onset.

#### 1.2.1 The U.S. Economy After World War I:

During the war and the early 1920s, the U.S. experienced rapid economic growth fueled by Europe's demand for goods and its diminished economic presence. This growth was also driven by innovations from the Second Industrial Revolution (electricity, automobiles) and the rationalization of labor.

Stock prices rose continuously, contributing to widespread wealth accumulation. Americans increasingly borrowed money to buy stocks, creating a perception of risk-free investment as stock prices kept rising for over a decade.

Real estate speculation surged, along with an influx of immigrants, even though the U.S. implemented immigration quotas in the 1920s. Immigration slowed significantly in the 1930s.

Economic growth was coupled with an increase in consumer credit, allowing for higher spending and investment.

The introduction of broker loans allowed investors to finance stock purchases through borrowing, leveraging their investments.

#### 1.2.2 Impact of World War I on the U.S. Economy:

The global conflict of 1914-1918 significantly boosted the U.S. economy. Allied powers spent heavily on American goods, creating a gap between the rising U.S. standard of living and the declining standards in Europe, which was burdened by enormous debt to the U.S.

In terms of trade and finance, Wall Street surpassed its European counterparts. During the war, European nations lost significant market share in South America as they focused on military efforts. The U.S. capitalized on this to strengthen its position in these markets.

#### 1.2.3 A Dynamic Growth Period:

Until 1929, the U.S. economy delivered exceptional growth. By 1929, the country was at its peak, marked by overconfidence. The 1929 crisis, therefore, shocked the entire world. Optimism was so high that some believed poverty would soon be eradicated.

This atmosphere of confidence and growth attracted more participants to the financial markets. In the years leading up to 1929, the stock market experienced record gains of +27% and +31%.

New Financial Mechanisms: One of these mechanisms allowed investors to purchase securities by paying only a fraction of their cost upfront and settling the balance upon resale. While this strategy was favorable during periods of economic growth, it posed significant risks in the event of a market downturn.

**1.2.4 Origins of the 1929 Crisis:**

The American crisis stemmed from the development of an uncontrolled and risky financial innovation: the "call loan." Since 1926, investors were able to buy and sell on credit with only a 10% margin. This meant that 90% of the purchase of a security was financed through borrowing, often at very low interest rates.

American households took on massive debt to acquire stocks. Their strategy was to sell their shares later at a higher price than they had paid, with the gains exceeding the interest on the loan.

Starting in 1927, a speculative bubble formed on Wall Street: the value of stocks inflated without any rational basis. For example, between 1921 and 1929, industrial production increased by about 50%, while the stock market surged by 300%.

However, by early 1929, the U.S. economy began to falter. Industrial production dropped by 7% between May and October, as available capital flowed into the stock market rather than into the real economy.

**1.2.4.1 Effect of Leverage and Financial Market:**

In the 20s, the leverage effect was viewed as a magical tool that allowed everyone to become wealthy through speculation in 1920, margin purchases by individuals were common, with two sorts of lenders: commercial banks, which lent out the new currency, and financial institutions, which used savings to finance investments.

• At the time, substantial debt use was seen positively, leading to speculation on financial markets without a clear understanding of its risks.

• While some investment funds use leverage, most asset managers exercise caution due to the significant risks associated with it.

**1.2.4.2 The dynamics of the lever effect and the 1929 crisis:**

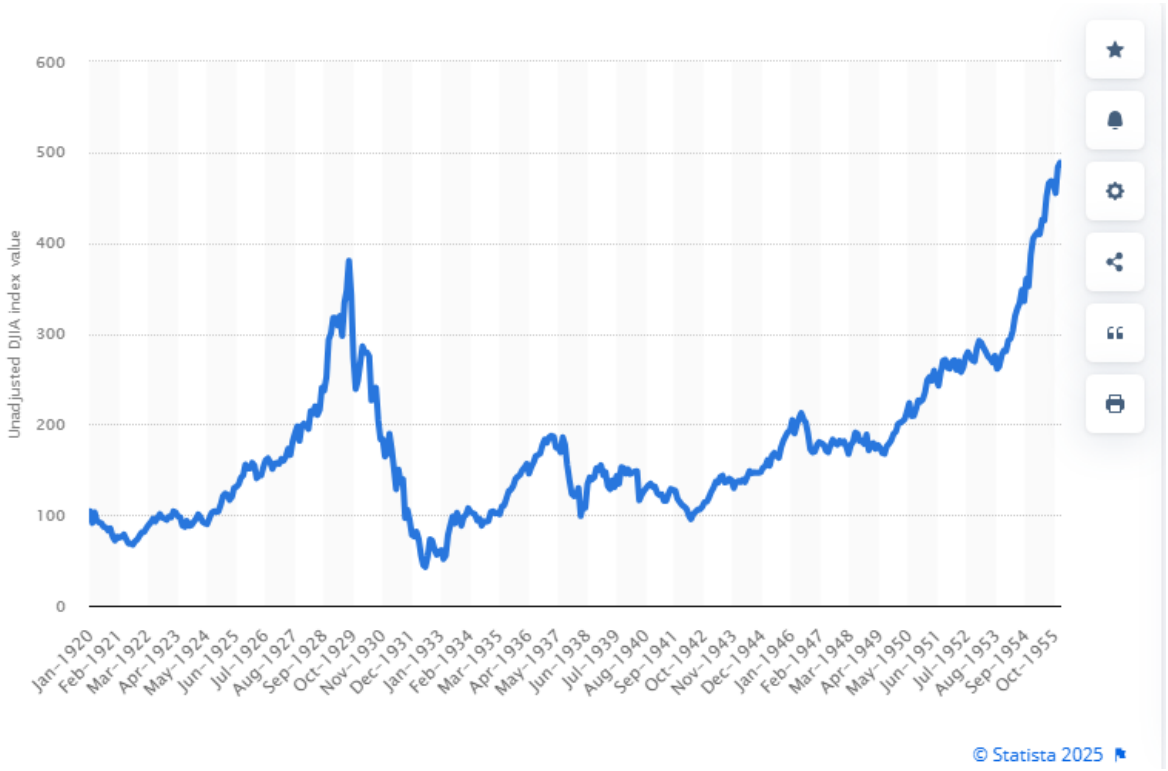
buying pressure is inextricably linked to loan facilitation.

•While borrowing conditions were good, stock markets were in full expansion, but a sharp increase in margin requirements reduced investors' purchasing power, triggering a chain reaction of sales. •When market losses began to become apparent in 1929, lenders were required to recover their funds, which led to enormous sales of securities, exacerbating the market's price decline.

• Fear and lack of trust among creditors negatively impact loan terms, increasing pressure to sell.

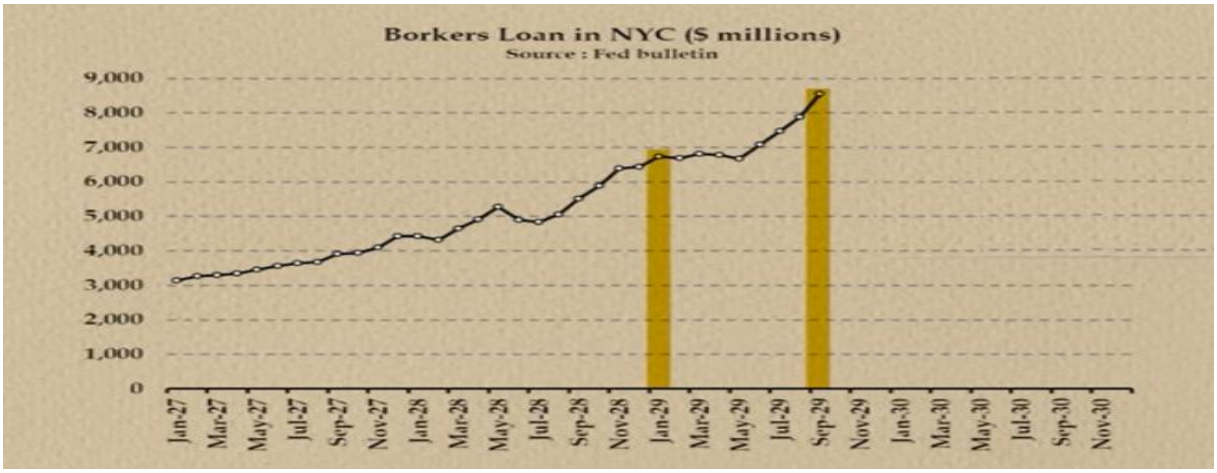
The financial system at the time was particularly vulnerable, as many businesses and investors used debt to finance their investments, creating a dangerous environment that contributed to the collapse.

Figure 1 showed private debt level before each crisis:




Throughout the 1920s, prices on the U.S. stock exchange rose exponentially, however, by the end of the decade, uncontrolled growth and a stock market propped up by speculation and borrowed money proved unsustainable, resulting in the Wall Street Crash of October 1929. This set a chain of events in motion that led to economic collapse - banks demanded repayment of debts, the property market crashed, and people stopped spending as unemployment rose. Within a year the country was during an economic depression, and the economy continued a downward trend until late-1932.

Figure 2 showed the broker loan trend that leaded to a great speculation.



Broker loans in New York City between 1920 and 1930 played a crucial role in stock market speculation, especially leading up to the 1929 crash. Here are some key statistics and trends:

**Key Figures and Trends:**

1920-1925: Moderate Growth, broker loans were relatively stable, rising gradually from around $2 billion in 1920 to about $3.5 billion by 1925.

The stock market was growing, but speculation was not yet at its peak.

1926-1929: Rapid Increase, as stock prices surged, broker loans skyrocketed, reaching over $6 billion in New York City alone by mid-1929.

Margin buying (borrowing money to buy stocks) became extremely popular, contributing to an overheated market.

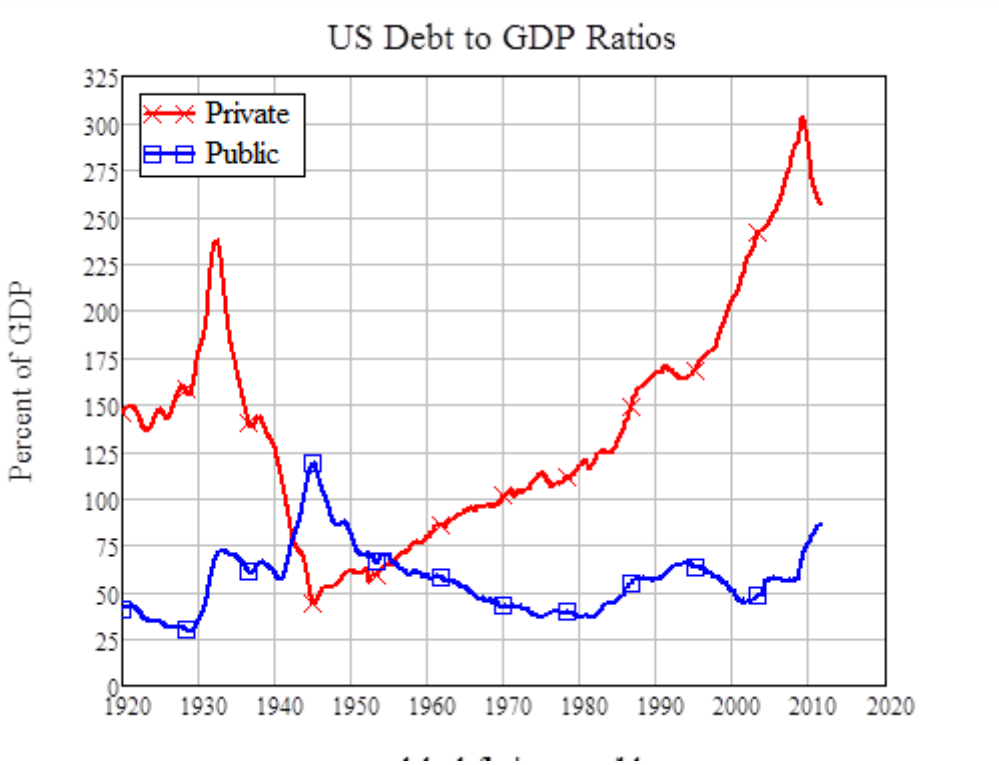
Late 1929: The Crash and Decline, following the Wall Street Crash of October 1929, broker loans collapsed as banks demanded repayment.

By early 1930, broker loans had fallen to below $2 billion, as lending dried up and stock values plunged.

Why has It Mattered? The heavy reliance on margin trading amplified the stock market boom but also made the crash far worse.

The Federal Reserve had tried to curb excessive speculation by tightening credit in 1928, but speculative borrowing still reached record highs.

Figure3: showed public and private debt growth:



The Private Debt to GDP ratio in the U.S. from 1920 to 1940 reflects the financial expansion of the 1920s, the collapse during the Great Depression, and the slow recovery through the 1930s. Here's a general breakdown:

**Key Trends in U.S. Private Debt to GDP (1920–1940):**

1920-1929: Rising Debt, Private debt grew significantly as consumer and business borrowing increased.

The ratio of private debt to GDP rose from around 50-60% in 1920 to nearly 100% by 1929 due to stock market speculation and easy credit.

1929-1933: Great Depression and Debt Deflation, the stock market crash in 1929 led to mass defaults, reducing private debt.

GDP shrank significantly, making the debt-to-GDP ratio spike to over 120% by 1932-1933, even though total private debt was falling.

The U.S. banking system collapsed, reducing credit availability.

1934-1940: Deleveraging and Recovery, with bank failures and deflation, total private debt declined.

By the late 1930s, GDP growth outpaced debt accumulation, lowering the ratio to around 80-90% by 1940.

### 1.2.4.3 The crisis of overproduction and its consequences

The economic slowdown is a result of a surplus production crisis and unequal distribution of money.

The 1929 crisis is sometimes viewed as the result of overproduction, in which the supply far exceeds the demand. This is exacerbated by economic inequalities that prevent some consumers from supporting the economy.

In this scenario, deflationary and wage-reduction policies implemented by some countries have further exacerbated the crisis by limiting consumers' purchasing power.

#### 1.2.4.3.1 Incorrect economic policies throughout the crisis:

Politicians have responded everywhere by doing the opposite of what should have been done.

During the crisis, governments implement policies such as raising interest rates, decreasing wages, and implementing budget austerity, worsening the economic situation.

These measures aim to attract international investors, but instead result in enormous deflation and worsening the Unemployment Decisions made at this time are frequently the result of a limited understanding of the economic mechanisms at work, pushing countries into a downward spiral.

Without a doubt, the system worked, but for it to be sustainable, at least two conditions must be met:

- The borrowing rate must remain low.
- The stock market growth rate must remain high.

If either of these parameter's falters, the system will collapse.

**1.2.4.3.2 Economic Consequences During the Depression:**

To describe the crisis of the 1930s, we use the term 'economic stagnation'; it wasn't just a recession but a depression.

This period saw not just a temporary downturn but a sustained contraction of the economy over several years.

U.S. unemployment rates exceeded 15% for a decade, peaking at 25%.

Unlike more recent economic crises, during the Great Depression, few social safety nets existed, leaving many people without support.

**1.2.5 The 1929 Crash: The Unraveling of the Crisis:**

In August 1929, to curb speculative activity, the Federal Reserve ultimately decided to raise its base interest rate to 6%.

Individuals were forced to repay their loans as quickly as possible and rushed to the stock market to sell their shares. The supply of stocks far exceeded demand, as everyone tried to liquidate their holdings, and no one wanted to buy, exacerbating the decline in stock prices.

Thus, a series of events unfolded in the stock market:

**Black Thursday (Thursday, October 24, 1929):** The Dow Jones index lost 22.6% during the morning session, causing panic. The injection of capital by banks artificially buoyed the market, limiting the decline to 2.1%.

**Black Monday (Monday, October 28, 1929):** The Dow Jones index fell 13% by the close of trading. The speculative Bubble had definitively burst.

**Black Tuesday (Tuesday, October 29, 1929):** The Dow Jones index dropped another 12% by the close.

The 1929 stock market crash divides the interwar period into two distinct phases:

**1919-1929:** The euphoric post-war period marked by consumption, innovation, and industrialization.

**1929-1939:** The catastrophic pre-war period characterized by the rise of dictatorships, economic crisis, and social struggles.

### 1.2.6 Consequences of the Crisis in the USA:

The crisis first struck the United States, leading to:

#### 1.2.6.1 The Stock Market Crisis:

Between September 3, 1929 (index = 381), and November 13, 1929 (index = 198), the Dow Jones index fell by 48%. A domino effect caused the collapse of the entire stock market. Investors were unable to repay their loans to banks, which were further strained by a run on deposits as individuals rushed to withdraw their savings. Many banks had also invested heavily in the stock market to capitalize on what appeared to be endless growth.

#### 1.2.6.2 The Banking Crisis:

The stock market crisis quickly turned into a banking crisis because banks had actively participated in speculation and were severely impacted. They could no longer provide loans to industries or consumers. Consequently, many banks went bankrupt:

1929: 642 Banks.

1930: 1,345 Banks.

1931: 2,245 Banks.

#### 1.2.6.3 The economic Crisis:

The contraction of credit deprived the U.S. economy of its primary engine for investment, leading to a sharp economic downturn (economic depression).

**In industry:** Production declined, prices fell, unsold goods piled up, and businesses closed, exacerbating unemployment.

**In agriculture:** Farmers were left with unsold crops, making it impossible for them to repay their debts. As a result, they were evicted from their land by banks.

#### 1.2.6.4 The Social Crisis:

Displaced farmers swelled the ranks of the unemployed in major urban centers.

Poverty spread, and unemployed individuals could no longer afford necessities, relying on state aid through soup kitchens.

Business closures drove unemployment to 25% by 1933.

The longer the situation persisted, the worse it became the vicious cycle of the Great Depression was set in motion.

**1.3 Global Spread of the Crisis:**

**1.3.1 The debt and the monetary system after the First World War:**

To pay their bills, most American industries use dollars issued by the American banking system.

Following World War I, allied nations were heavily reliant on private American banks instead of paying in gold.

The US requires countries like France and the UK to repay debts with gold, which is hard to fulfill due to a lack of available gold.

This dilemma is exacerbated by the fact that Americans have been paid in dollars since the beginning, and the possibility of canceling this debt was deemed unthinkable at the time.

**1.3.2 The impact of the 1929 financial crisis on international lending:**

The American banks will stop lending. The 1929 crisis led to a halt in loans from private American banks, making it difficult for countries to refinance their debt in dollars.

The current crisis causes financial panic as countries begin to pay their debts in gold, further destabilizing their economies.

As a result, several countries find themselves in a precarious position, with debts dating back to the First World War and still reliant on the dollar for international trade.

The crisis that began in the United States quickly spread to Europe, with England, France, and Germany being the hardest hit. American banks, which had invested capital in Europe, began to repatriate their funds. This forced many European banks to repay their debts, leading to numerous bank failures. International trade contracted due to the lack of funds, and unsold inventories accumulated worldwide.

**1.3.2.1 In Germany :**

In Germany, the failure of the **DANA-BANK** in July 1931 triggered the collapse of the banking system. A general decline in manufactured goods prices ensued, varying by country and sector, and reaching 30% between 1929 and 1932. In agriculture, already struggling for over a decade, wholesale agricultural prices fell by **65%**, leading to the destruction of entire stocks of wheat and unsold vehicles.

**1.3.2.2 In England:**

Heavily indebted and unable to repatriate investments made in Germany, the United Kingdom abandoned the gold standard for its currency, which was devalued by 40% in September 1931. The fall of the British Pound triggered declines in the value of about thirty linked currencies (e.g., Scandinavian, Portuguese, and Egyptian currencies). International financial flows were completely disorganized, and global trade sank into stagnation. International trade began to decline in 1930 and hit its lowest point in 1932.

**1.3.2.3 In France:**

France, relatively insulated from the global downturn due to its limited involvement in the international banking system, was nevertheless impacted by the 1929 crisis. The British Pound's devaluation destabilized the French Franc. The decline in agricultural prices, which began in 1930, accelerated, while falling exports caused industrial production to drop. By 1933, France had already recorded **1.5 million unemployed people**.

**1.3.2.4 In the Colonies:**

After European countries, the colonies in Latin America, Asia, and Africa also felt the impact of the crisis. Western nations could no longer afford to purchase their agricultural and mineral products.

**1.4 Solutions to the Crisis:**

The resolution of the crisis originated in the United States, where it had begun. Starting in 1932, President **Franklin D. Roosevelt** implemented a new economic policy: the **New Deal**.

The government no longer allowed the economy to self-regulate. It introduced laws to reduce agricultural and industrial production.

To revive demand, the population needed money. The government provided aid to the poorest and established a robust social assistance system.

The state initiated numerous public works projects, which created extensive employment opportunities.

However, this intervention did not have the desired economic impact. Like a sick patient, the U.S. economy relapsed in 1937. The true recovery came with the advent of **World War II**, as the war economy brought a more sustainable revival. Unemployment rates fell to levels comparable to those of 1928.

**1.5 Conclusion:**

The 1929 economic crisis introduced new measures that profoundly transformed the nature of liberal capitalism. The global upheaval caused by the crisis can be seen as one of the underlying factors of **World War II**, as it facilitated the rise of authoritarian regimes.

## 2.The Subprime Mortgage Crisis (2007-2008):

Triggered in the United States in 2007-2008, the subprime mortgage crisis stemmed from excessive household debt. Due to economic and financial interdependence between countries, the crisis quickly spread worldwide.

### 2.1 What Are Subprime Mortgages?

"Subprime" refer to home loans granted to Americans with low incomes. In the early 2000s, banks issued a significant number of these loans, encouraged by political support that viewed the real estate boom as a short-term economic stimulant.

Most economists failed to foresee the subprime mortgage crisis, so it's crucial to first explain what it entailed:

The crisis was triggered by the collapse of the U.S. housing market in late 2007. At that time, housing prices began to fall, contributing to the subsequent financial crisis.

Before the crisis, many economists, including influential figures like Olivier Blanchard of the IMF, believed that dominant economic theories since the 1970s were sound and the future looked promising. However, this outlook changed dramatically with the unexpected collapse of major financial institutions.

While finance is integral to the economy, many economists were unable to predict a crisis of this scale, raising questions about the efficacy of traditional economic analyses in addressing complex realities.

### 2.2 The Inflation of the Housing Bubble:

As Americans increasingly purchased homes using cheap credit, real estate prices surged. This followed the basic principle of supply and demand: since it is challenging to adjust the housing supply in the short term due to construction delays, growing demand led to scarcity and, consequently, higher prices.

The rising property prices encouraged more Americans to take on debt to afford increasingly expensive homes. Economists refer to this mechanism, where easy credit drives rising prices, as a **speculative bubble**.

This cycle of debt accumulation was supported by a financial practice common in the United States but less familiar in countries like France: **home equity loans**. These allow homeowners to borrow against the increased value of their property as its price rises.

### 2.3 Borrowers and Mortgage Loans:

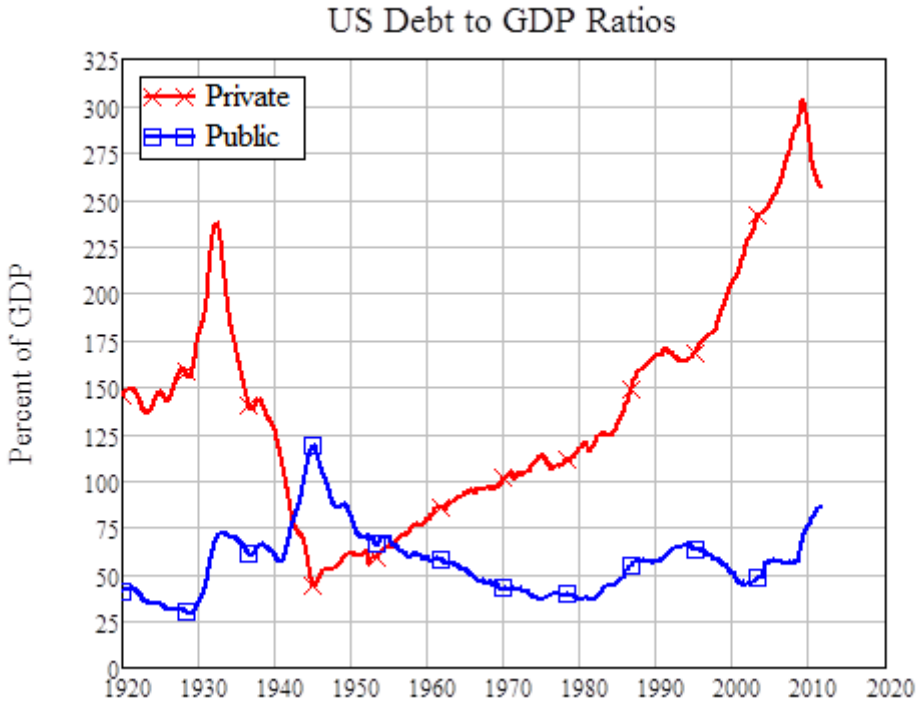
Banks began lending to subprime borrowers, which seemed reckless given their inability to repay.

In the 2000s, banks expanded their loan portfolios by granting credit to subprime borrowers—those with limited repayment capacity. This trend was fueled by factors like government policies and agencies promoting homeownership for low-income households.

Subprime loans allowed borrowers to initially pay only interest, making credit more accessible to those with limited income, which in turn fueled a housing bubble.

Refinancing mechanisms enabled borrowers to leverage rising home values to renegotiate loans, leading to overconfidence among banks about the housing market's stability.

Figure 4:




In figure 4, today we are seeing debt grow again. In the U.S. we are looking at some of the highest levels of private debt since the great depression, as a percentage of GDP. It dropped to as low as 196% in 2013. But last year private debt has grown again to represents 199.6% of GDP. Economic growth is likely to go negative within the next few years. This is what Japan has experienced for over twenty years. According to Reuters, Australian born economist Steve Keen warns that the US may be caught in the same situation unless something different happens. One way to stave off a depression is to generate a level of government spending that's necessary to reduce the level of private debt. China's private debt levels is on a rather steep incline along with a few other countries. Private-sector debt exceeds 200% of GDP in China, making it

look like the “over-indebted economies of Ireland and Spain prior to 2008, but obviously far more significant to the global economy. “This bubble has to burst,”.

**2.3.1 The Refinancing Dynamic and Housing Value:**

When refinancing a mortgage, the new loan amount is based on the home's current value, this allows the borrower to repay the old loan, remaining financially stable for a few years.

However, the monthly cost of the new loan can rise, when principal repayments begin. This increase becomes problematic if the borrower has already exhausted the surplus funds from the initial refinancing.

**2.3.2 Risks of Housing Market Speculation:**

The refinancing logic relies on the assumption that housing values will continually rise, which is not always true. At the peak of the housing bubble, this assumption led to a crisis as many borrowers, unable to repay loans, lost their homes.

When housing prices begin to fall, refinancing options diminish, trapping borrowers without alternatives. This creates an oversaturated market with banks repossessing numerous properties but unable to sell them at sufficient prices to recover losses.

**2.3.3 Mechanics of the Housing Market and Speculative Bubbles:**

Rising housing prices are often driven by buyer competition and bidding wars, leading to artificially inflated property values.

Banks, providing loans based on these inflated prices, take excessive risks, hoping the upward trend will persist. However, when speculation halts, prices can plummet, leaving many market participants in financial distress.

**2.3.4 The Impact of Wages on the Housing Market:**

The disparity between rising home prices and stagnant wages creates an unsustainable gap. Borrowers eventually realize they can no longer afford to repay even the interest, leading them to exit the market.

This reduces the pool of buyers, making it harder to sell properties, which subsequently drives prices down further.

**2.3.5 Growth of Mortgage Lending in 2006:**

In 2006, mortgage loans in the U.S. reached $1.25 trillion, of which $600 billion were subprime loans.

That year, the U.S. mortgage market was particularly robust, with $1.25 trillion in loans issued. A significant portion—$600 billion—consisted of high-risk subprime loans granted to borrowers with weaker credit histories.

By comparison, the Eurozone recorded $365 million in mortgage lending, highlighting stark differences in access to housing credit between the two regions.

### 2.3.6 Limits of Commercial Banks:

Commercial banks quickly reached their lending limits and turned to investment banks for additional capital.

Commercial banks, primarily lending to "prime" borrowers, encountered limits due to their size and risk calculations. To continue lending, they began selling mortgages to investment banks, which had more resources to absorb these debts.

Investment banks on Wall Street played a pivotal role in housing finance, enabling commercial banks to maintain lending activity while offloading risks.

### 2.3.7 The Securitization Process:

Securitization bundles numerous mortgage loans into a single financial product, divided into tranches, which can then be sold on financial markets.

Securitization transforms mortgages into composite financial products, allowing investment banks to pool various loans into entities called Mortgage-Backed Securities (MBS).

These products attract diverse investors by offering different levels of risk and return, facilitating funding flows for the housing market.

### 2.3.8 The Link Between the U.S. Housing Market and Wall Street:

The interconnectedness of the U.S. housing market and financial markets created a chain reaction, linking American borrowers to global investors. This amplified risks on these loans, making them less apparent to commercial banks.

Commercial banks, traditionally cautious in assessing repayment risks, shifted their role by selling loans to Wall Street, transferring potential defaults to investment banks.

Investment banks, distant from borrowers' realities, relied on statistical models to evaluate creditworthiness rather than direct assessments of financial situations.

### 2.3.9 Complex Financial Products and Underestimated Risk:

Wall Street created complex financial products, combining various loan types (mortgages, consumer loans, student loans) to dilute and diversify risks.

Before the crisis, statistical models underestimated default risk, predicting rates of only 1–1.5%. Defaults soared to 11% during the crisis.

This overconfidence in mathematical models obscured warning signs of the crisis, enabling the housing bubble to grow unchecked.

### 2.3.10 The Emergence of the Housing Bubble and Subprime Borrowers:

A U.S. housing bubble emerged due to subprime loans granted to borrowers with insufficient income.

Subprime mortgages surged in the early 2000s as banks offered flexible terms, allowing borrowers to initially pay only interest.

This created dependence on rising housing values; when prices dropped, borrowers could not refinance, triggering defaults and worsening price declines.

Banks, facing massive defaults, repossessed homes, fueling a downward spiral in the housing market. The lack of available credit for buyers further exacerbated the collapse.

## 2.4 The Subprime Crisis According to the "Orthodox" Perspective:

The subprime crisis arose from an American housing bubble fueled by excessive financial market lending.

Occurring between 2007 and 2008, the crisis was caused by a housing bubble driven by excessive loans. This trend was exacerbated by financial markets extending credit to high-risk borrowers.

When the market began to collapse, the global financial system became entangled in a complex and failing structure, leading to widespread panic that paralyzed financial operations.

Rising housing prices were disconnected from stagnant wages, making homeownership increasingly unaffordable.

Housing price trends revealed an exponential increase in the late 1990s, while household incomes stagnated. This led to a widening gap between earnings and living costs, particularly in housing.

The accumulation of private debt in the U.S. highlighted rising indebtedness among businesses and households compared to their incomes. This growing repayment pressure, without proportional wage growth, raised concerns about long-term financial sustainability.

Households and businesses interact with banks, creating a financial cycle.

Money in the economy is used primarily to pay salaries and generate business profits. Households spend this money on consumption, with some savings deposited in banks.

Banks play a crucial role as financial intermediaries, taking deposits from savers and lending money to those financing projects, such as home purchases. Banks profit from the interest on loans, which typically exceeds the interest paid on savings accounts.

Commercial and investment banks serve different but complementary roles in business financing.

Investment banks provide funding to businesses rather than individuals, including investments in new projects or expansions.

Financial markets allow savers to invest in businesses, either as shareholders or lenders, strengthening the connection between investment banks, companies, and savers.

Businesses predominantly rely on debt rather than issuing new shares for financing.

Companies have several financing options but generally prefer debt, such as issuing bonds, which simplifies the financial system while meeting funding needs.

Borrowers whether individuals or businesses must repay loans with interest. Shareholders, on the other hand, receive a share of profits as dividends, representing another form of income tied to business ownership.

Capitalists earn income from capital, such as interest or business profits.

The population is divided into two main categories: workers and shareholders. However, a new category, creditors, has emerged, including those earning interest-based income, highlighting the dual nature of capitalists as creditors and shareholders.

Capitalist income derives from money working for them, whether through interest from loans or profits from owned assets like real estate. For example, owning property generates rental income, considered a form of capital income.

Companies contribute to GDP by paying wages and dividends.

Income earned by workers and capitalists is reinvested into the economy, influencing the GDP. Households spend part of their income, saving or investing the remainder in businesses.

Companies' finances are also impacted by debt repayments and interest payments. Similarly, household payments to financial institutions for loan repayments are counted as consumption, cycling money back to businesses.

Debt cannot exceed the total income of the population.

An economy's debt is typically less than its GDP, as the total debt of businesses and households generally cannot surpass the income generated in the economy.

Although debt is a stock and GDP is an annual flow, debt accumulates year by year, while GDP resets annually. In theory, debt can exceed GDP temporarily, but the annual debt increase must be less than the income generated.

Debt may seem insignificant as it often represents a simple transfer of purchasing power.

Debt in an economy reflects a distribution of money between savers and spenders. As long as repayment commitments are honored, purchasing power remains constant.

If a borrower defaults, economic value isn't destroyed but purchasing power is redistributed. Debt is inherently linked to how individuals manage consumption and savings.

Borrower defaults redistribute purchasing power but can lead to bank failures.

Banks must repay depositors while extending loans. If many borrowers' defaults, banks may fail to return depositors' money, potentially triggering bankruptcies, as seen in the subprime crisis.

While total debt may not harm the economy, individual defaults can significantly destabilize the banking system.

Economic growth requires either increasing the money supply or its circulation speed.

Growth occurs by increasing the speed of money circulation within the system. Faster circulation boosts GDP, even if the money supply remains constant.

Alternatively, growth can be stimulated by increasing the money supply, typically through central banks injecting money into the economy.

Banks must lend savings, as savings are rewarded.

Money creation involves central banks generating base money, prompting commercial banks to create credit money through new loans. If money circulation remains constant, the monetary system's money supply increases.

Banks face dual responsibilities: lending to ensure profitability while financing only viable projects to minimize defaults, ensuring economic stability.

The subprime crisis was a statistical anomaly in an otherwise stable economic system.

The U.S. subprime crisis had global repercussions due to a complex financial system where defaults affected all economic players. This disrupted money circulation, leading to economic stagnation and a declining GDP.

Inefficient money circulation creates a downward spiral: declining GDP reduces household and business income, leading to lower consumption and investment, perpetuating the cycle.

**Rationality and Irrationality in the Economic System**

The subprime crisis was a statistical anomaly, an abnormal reaction by financial actors.

The subprime crisis highlighted collective irrationality among market participants. Banks, households, and investors made decisions that defied rational principles.

This phenomenon reveals that even a stable economic system can suffer catastrophic consequences from human errors and poor judgment, emphasizing the need to monitor monetary and borrowing dynamics.

**2.5 The Subprime Crisis According to "Heterodox" Economists:**

The dominant economic model does not anticipate the subprime crisis:

The dominant economic model views banks as mere financial intermediaries with minimal power. It suggests that the central bank controls the money supply while neglecting the role of debt.

Many figures showing private debt in the U.S., including household and corporate debt, reveals exponential growth compared to GDP. This raises questions about how debt can outpace income growth, especially when wages remain stagnant.

This leads to discussions on where the additional money enabling higher debt levels originates.

Money creation operates differently than the classic model suggests:

The discussion revisits the classic model of money creation, pointing out that central bank theories often fail to align with observed economic data.

A 2014 Bank of England report highlights that money creation primarily occurs through commercial banks, which have significant discretion in lending, often preceding central bank interventions.

Commercial banks expand the money supply, with the central bank stepping in only later to regulate.

Repaying debt leads to monetary destruction, when 1,000 units of currency are injected into the economy as debt (split between households and businesses), a reverse dynamic occurs where consumers must first borrow to generate income.

Repaying debt not only involves interest payments but also reduces the money supply, as the repaid funds essentially "disappear" from the economy.

Money exists only when in circulation; once debt is repaid, the money ceases to exist.

Debt is often confused with money creation, Current monetary creation is tied to household and corporate borrowing, driving expenditures that stimulate business activity.

Borrowed money circulates into essential payments like wages and debt interest, creating a financial cycle that primarily benefits banks.

Excessive borrowing without adequate repayment mechanisms can lead to crises, such as reduced GDP and declining consumption.

Defaults on loans, like hypothetical situation, disrupt financial stability, Defaults can cascade through the financial system, leading to potential bank failures and widespread economic instability.

Commercial banks' discretion in lending places economic actors in precarious positions, amplifying risks in times of default.

Debt continues to grow while GDP resets periodically, a rising debt-to-GDP ratio raises concerns about economic sustainability.

Higher savings rates can increase available funds for lending, but constant ratios eventually stabilize debt-to-GDP trends, assuming consistent GDP growth.

Money created by banks contributes to GDP growth, new debt split between households and businesses spurs consumption and wages, increasing GDP proportionally.

Excessive debt growth relative to GDP often stems from financial markets rather than domestic income, highlighting global interdependencies.

Private debt is the main driver of monetary creation in economies, Private debt, averaging 250% of GDP, significantly overshadows public debt at 90%.

Failures in private debt repayment have severe consequences, such as widespread bankruptcies, unlike sovereign defaults, which are rarer.

Debt-driven bubbles destabilize the economy, investors borrow to buy assets, betting on price increases. This fuels bubbles, with banks complicit due to their lending practices.

When debt repayment falters, asset prices collapse, disrupting financial systems and reducing GDP.

Governments must counteract private debt repayment cycles; states can fund projects to offset credit contraction and maintain monetary circulation.

Effective oversight prevents speculative bubbles that lead to systemic crises.

While public debt garners attention, private debt's role in economic crises often goes unnoticed.

Creators encourage viewer engagement and provide resources for further exploration, aiming to demystify complex topics like the subprime crisis.

**2.6 The Crisis Trigger: Falling Housing Prices:**

To slow the housing bubble's momentum, the U.S. Federal Reserve (FED) raised interest rates starting in 2005. By increasing the rates at which it lent money to banks, the FED aimed to raise interest rates across the economy, making borrowing more expensive and discouraging excessive credit use.

At the same time, higher interest rates made existing loans more costly for homebuyers. In the U.S., most mortgages have variable interest rates. As a result, many borrowers could no longer afford their monthly payments, leading to loan defaults and losses for banks. Properties tied to unpaid loans were seized and sold at auction, flooding the market with homes and triggering a sharp decline in real estate prices.

The collapsing housing market destabilized a large part of the U.S. economy. Banks faced severe difficulties, culminating in the **September 15, 2008**, bankruptcy of **Lehman Brothers**, an event that caused a panic not seen since the Great Depression of 1929.

**2.7 Global Spread of the Crisis:**

Given the U.S.'s significant role in the global economy and the high level of trade, banking, and financial interdependence among advanced nations, the rest of the world was rapidly affected. This crisis became the most severe global economic downturn since World War II, with negative impacts still being felt more than a decade later.

Public debt levels in the U.S. nearly doubled due to declining tax revenues and the government's financial support for the banking sector.

**2.8 Policies to Combat the Crisis:**

**2.8.1 Monetary Measures:**

To curb the crisis, central banks injected more money into the economy, and governments increased spending to mitigate the effects, such as rising unemployment.

One key tool used by central banks was **quantitative easing (QE)**. This involved creating money to purchase financial securities, such as bonds, from financial institutions, thereby boosting liquidity and supporting economic activity.

### 2.8.2 Fiscal Policies:

Governments implemented fiscal policies to support the economy, such as increased public spending. These measures produced mixed results. In the United States, they led to a relatively quick economic recovery. In Europe, however, they failed to prevent the eurozone from entering another crisis: the **sovereign debt crisis**.

### 2.9 Mortgage crisis conclusion:

The financial crisis originates from the downturn in the U.S. housing market and the losses it caused for players in the subprime mortgage market. Ironically, the burst of the American housing bubble was no surprise. Since 2003, numerous observers, including within the Federal Reserve (Fed), warned that the rapid rise in U.S. residential real estate prices could not be entirely explained by economic growth, population increase, or low interest rates maintained by Alan Greenspan's monetary policies.

Robert Shiller drew parallels between the housing bubble of the 2000s and the financial bubble of the late 1990s, predicting that similar speculative movements would lead to a sharp market correction. Between January 1997 and July 2006, U.S. residential property prices almost doubled before falling abruptly. The price-to-rent ratio—a key indicator—rose by 48% during this period but has since fallen by 16%.

The primary driver of the housing bubble was the rise of subprime mortgages, loans granted to borrowers lacking sufficient creditworthiness for traditional loans. Many subprime loans featured low promotional interest rates that later reset to higher variable rates indexed to the Fed's rates. Subprime lending ballooned from $200 billion in 2002 to $640 billion in 2006, comprising 23% of U.S. mortgages at the time.

As the Fed raised its rates from 1% in 2004 to 5.25% in 2006, monthly payments for subprime borrowers increased, leading to a wave of defaults. In 2007, 1.2 million defaults were recorded, a 79% increase from 2006. Even though the Bush administration encouraged loan renegotiations to avoid foreclosures, unsold homes surged, and the crisis caused significant social and economic damage.

This wave of insolvencies among subprime borrowers burst the housing bubble. Lenders faced substantial losses, estimated at $200–300 billion by The Economist.

Many creditors and banks suffered from the subprime crisis, with some failing entirely. For instance, New Century Financial Corporation went bankrupt in April 2007, and Northern Rock narrowly avoided collapse thanks to a $3 billion rescue loan from the Bank of England.

The contagion spread due to mortgage securitization, where banks sold subprime loans to investors, who in turn issued securities backed by these loans. This system divided the original risk among many investors but also introduced opacity, making it difficult to evaluate the true risk of these securities. Credit rating agencies like Moody's and Standard & Poor's assigned overly favorable ratings to some subprime-backed securities, misleading investors.

When the subprime mortgage market collapsed in 2007, the associated securities lost significant value, causing widespread losses among investors and banks. The complexity of financial instruments like collateralized debt obligations (CDOs) and special investment vehicles (SIVs) exacerbated the uncertainty, eroding confidence in the banking sector and triggering a liquidity crisis in mid-2007.

Central banks like the Fed and the European Central Bank (ECB) intervened with massive short-term liquidity injections, preventing a more severe banking crisis. Despite these efforts, banks had to acknowledge significant asset write-downs, with total losses estimated between $250–500 billion.

The uncertainty that interbank lending also affected financial markets. The U.S. Dow Jones Industrial Average, after peaking at 14 strained,000 points in July 2007, dropped 8% in a month. Although central bank interventions briefly stabilized markets, renewed fears of a credit crunch and recession drove the Dow below 12,000 points by early 2008.

The subprime crisis and its spillover into the financial sector raised concerns about Europe's exposure. European banks suffered significant losses, stock markets experienced steep declines, and some EU member states displayed signs of a housing bubble.

European banks faced substantial losses from the subprime crisis. Institutions like UBS, Crédit Agricole, Deutsche Bank, and Barclays reported billions in losses, prompting recapitalization efforts, often supported by sovereign wealth funds. Meanwhile, European stock markets fell more sharply than their U.S. counterparts.

Between 1997 and 2007, eurozone residential property prices rose by 76%, with significant increases in countries like Ireland, Spain, and the UK. While the subprime market was less prevalent in Europe, rising mortgage debt and a potential housing downturn in several member states pose risks to the financial system and the broader economy.

## 3.THE CRISIS OF ZONE EURO:

### 3.1 Introduction of the Euro:

The euro was first introduced on financial markets in 1999 and later as physical currency in 2002. The establishment of the euro marked the culmination of several stages. The initial project for a monetary (and economic) union, dating back to 1969 and known as the Werner Report, ended with the collapse of the Bretton Woods system in 1971. Subsequent exchange rate market instability following the 1973 oil crisis led to the failure of the European monetary snake (1972–1978), which aimed to limit exchange rate fluctuations among the member states of the European Economic Community (EEC).

In 1979, after these two failures, all EEC member states, except the United Kingdom, renewed their efforts to strengthen monetary integration and stability, resulting in the creation of the European Monetary System (EMS).

The EMS was a system where exchange rates remained stable but could be adjusted relative to the ECU (European Currency Unit), which was a weighted average of the participating currencies. During its existence, the EMS successfully achieved its primary objective of ensuring long-term exchange rate stability.

The Maastricht Treaty, which established the EU and aimed to create the euro, was ratified in 1992. The Maastricht convergence criteria, defining the conditions for a country to join the eurozone, were as follows:

I) Inflation must not exceed by more than 1.5% the average inflation of the three member states with the lowest rates.

II) The budget deficit must be below 3% of GDP.

III) public debt must be below 60% of GDP.

IV) No currency devaluation could occur within two years prior to joining the monetary union.

V) Long-term interest rates must not exceed by more than 2% the average rates of the three member states with the best price stability records.

Subsequently, the Stability and Growth Pact (SGP) was adopted in 1997, establishing fiscal discipline criteria for countries seeking to join the euro. The pact aimed to strengthen the convergence of European economies through coordination of fiscal policies while allowing flexibility in case of economic shocks. This coordination was essential since fiscal policy remained a national competence, while EU monetary policy was now directed by the European Central Bank (ECB) in Frankfurt.

The pact included two provisions: one was a surveillance mechanism emphasizing the need for balanced budgets, allowing governments to use the 3% deficit threshold to support the economy during recessions. The other was a corrective mechanism imposing sanctions for excessive deficits. If a eurozone member state's deficit exceeded 3%, it could face fines unless corrective measures were taken.

With these elements in place, the euro was introduced in 1999, replacing the EMS. The single currency brought numerous advantages. Its adoption ended the uncertainty of exchange rate fluctuations, benefiting European businesses by providing greater predictability for monetary flows and facilitating decision-making. European companies no longer needed to pay exchange rate hedging premiums or transaction costs for currency exchanges. Additionally, the euro acted as a catalyst for European trade by strengthening market integration for goods and services. These advantages also benefited European consumers through increased price transparency and heightened competition among businesses.

For European states, the primary benefit of the euro was the drop-in interest rates on their government bonds. The euro also increased the volume of financial transactions, boosting liquidity in the European market and making the eurozone more attractive to international investors. Furthermore, the euro became an international currency, with a significant portion of eurozone exports denominated in euros.

However, the introduction of the euro was not without challenges and incurred costs for EU countries. Initially, there was a period of instability during the transition to the euro, during which European markets were shaken by speculative waves (1992–1993). European countries also had to make concessions regarding two economic stabilizers: exchange rates and monetary policy autonomy.

The loss of the exchange rate instrument eliminated the possibility for governments to devalue their currencies to enhance competitiveness and boost exports. In the absence of this tool, competitiveness could only be improved through internal devaluation, primarily by reducing labor costs. However, many countries had already abandoned the option of external devaluation upon joining the EMS.

As for the loss of monetary policy autonomy, this meant that European countries could no longer adjust their monetary policies to their specific economic needs. Nevertheless, the transfer of monetary policy to the ECB was somewhat relative since joining the EMS already implied a loss of monetary autonomy (except for Germany).

Analyzing the construction of the euro and its characteristics is essential for understanding the causes of the European debt crisis. We now turn to the origins of this crisis and examine the role played by peripheral countries in adopting the single currency.

**3.2 The Causes of the Debt Crisis:**

In the aftermath of the financial crisis in the United States (2007-2008), nearly all European states had to bail out their banking systems and invest in revitalizing their economies. Many of these countries became over-indebted while experiencing low economic growth, sparking concerns among investors about their governments' repayment capacities. Consequently, three states—Greece (twice), Ireland, and Portugal—had to request financial support from the EU/IMF.

However, the root causes of the European debt crisis are only marginally related to the American crisis, which mainly acted as a trigger. The real origins of the European crisis lie within Europe itself and the common currency. These causes can be attributed to collective issues, such as poor control and mismanagement by the state in various areas of the economy (e.g., bank regulation, public finance oversight, inaccurate statistics, corruption, speculative development of certain economic sectors like real estate). Furthermore, the crisis stemmed from the broader European integration process, which failed to establish appropriate institutions and streamline existing bureaucratic structures. A fundamental aspect of this crisis is the loss of competitiveness caused primarily by adopting the euro, leading to the over-indebtedness of peripheral European states.

### 3.2.1 Loss of Competitiveness and Debt Accumulation:

Figure 5:

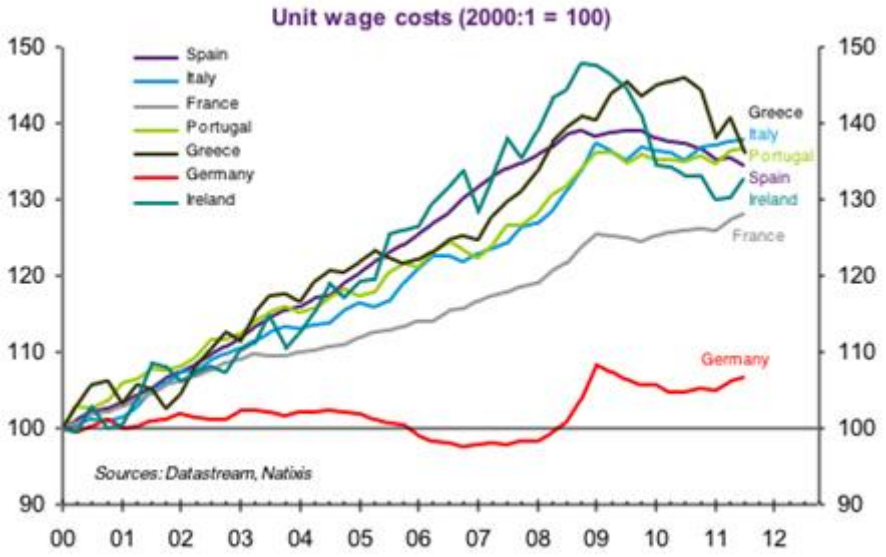
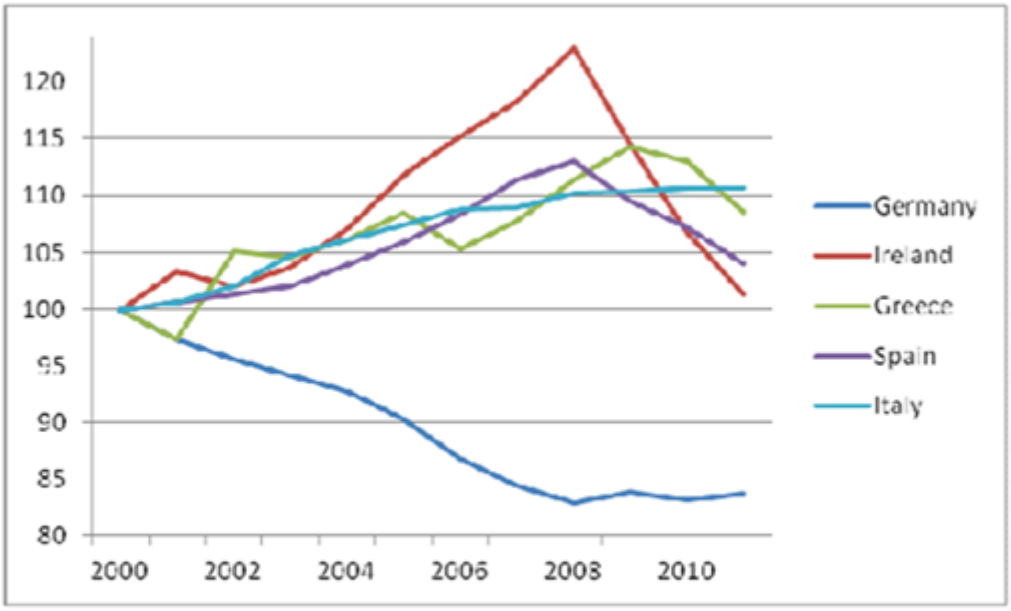



Figure 6:




Unit Labor Costs (nominal) of some euro area countries

*Source: AMECO Database, European Commission*

The adoption of a single currency means that disproportionate labor cost increases in one country compared to another cannot be corrected through exchange rate adjustments. Instead, these cost differences translate into relative changes in competitiveness (Barthe, 2011). Between the euro's introduction in 1999 and the eurozone crisis in 2009, annual labor cost growth in peripheral eurozone

countries was significantly higher: 5.37% in Greece, 5.87% in Ireland, 3.75% in Spain, 2.67% in Italy, and 3.72% in Portugal. In contrast, core countries like Germany experienced much lower growth rates, with Germany at just 1.78%. As a result, peripheral countries faced substantial competitiveness losses compared to the rest of the eurozone.

Comparing labor compensation growth to labor productivity reveals stark competitiveness disparities between core (Austria, Belgium, Finland, France, Germany, and the Netherlands) and peripheral (Greece, Ireland, Italy, Portugal, and Spain) eurozone countries. Labor costs in peripheral countries grew disconnected from productivity gains, whereas core countries, particularly Germany and Austria, managed to align wage growth with productivity, enhancing their competitiveness. The gap in cumulative labor cost impact was most pronounced before the crisis began.

This competitiveness loss contributed to persistent current account deficits in peripheral countries. Peripheral nations that failed to address competitiveness losses relied on external financial inflows, primarily from major European banks, to cover deficits. In contrast, core countries experienced substantial current account surpluses. The external debt of peripheral countries was not only public but also heavily driven by private sector borrowing to compensate for competitiveness deficiencies. Germany's private sector, by comparison, maintained significant financial surpluses.

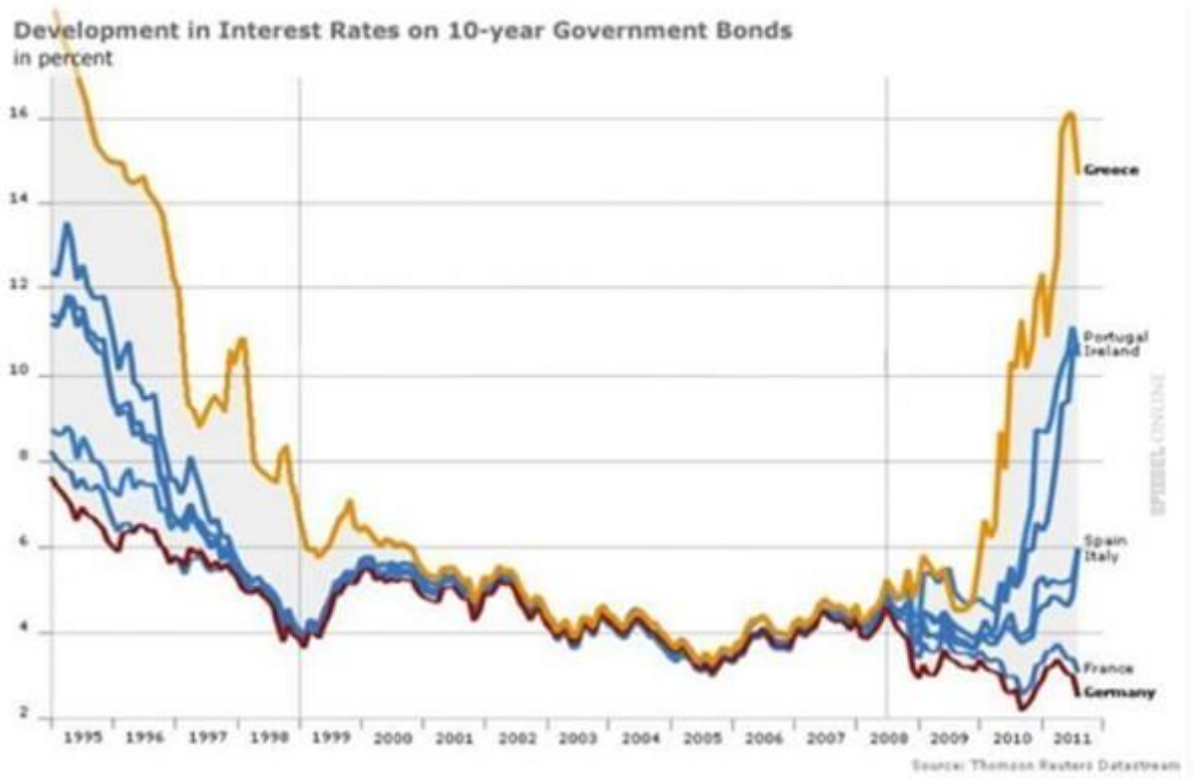
Eurozone integration facilitated this borrowing by lowering interest rates in the early 2000s. Lenders underestimated credit risks, if stronger European countries would support weaker ones in times of difficulty. This led to significant increases in total external debt (government, private sector, and households) in peripheral countries, with French and German banks being most exposed.

The Stability and Growth Pact, designed to coordinate fiscal policies and enforce budgetary discipline, failed for several reasons. The arbitrary 3% deficit limit lacked economic basis and was often ignored. When the European Commission attempted to warn Germany and Portugal about potential deficits in 2002, political pressures, particularly from Germany, led to inaction. Similar warnings to Italy and France also failed to result in meaningful sanctions, undermining the credibility of eurozone governance.

The difference in the competitiveness of euro area countries is significant, and it is one of the variables that explain the vulnerability in that area. Although members of the euro zone share the same currency, the economic and financial results are different, so that the financial problem of a small country affects the entire euro zone, while in the US, financial problems or competitiveness gap in the states has no effect on the whole country because there is an adjustment mechanism on a centralized budget, which is much greater than in the EU.

### 3.2.2 The Evolution of Interest Rates and Their Impact on Debt:

Figure 7:

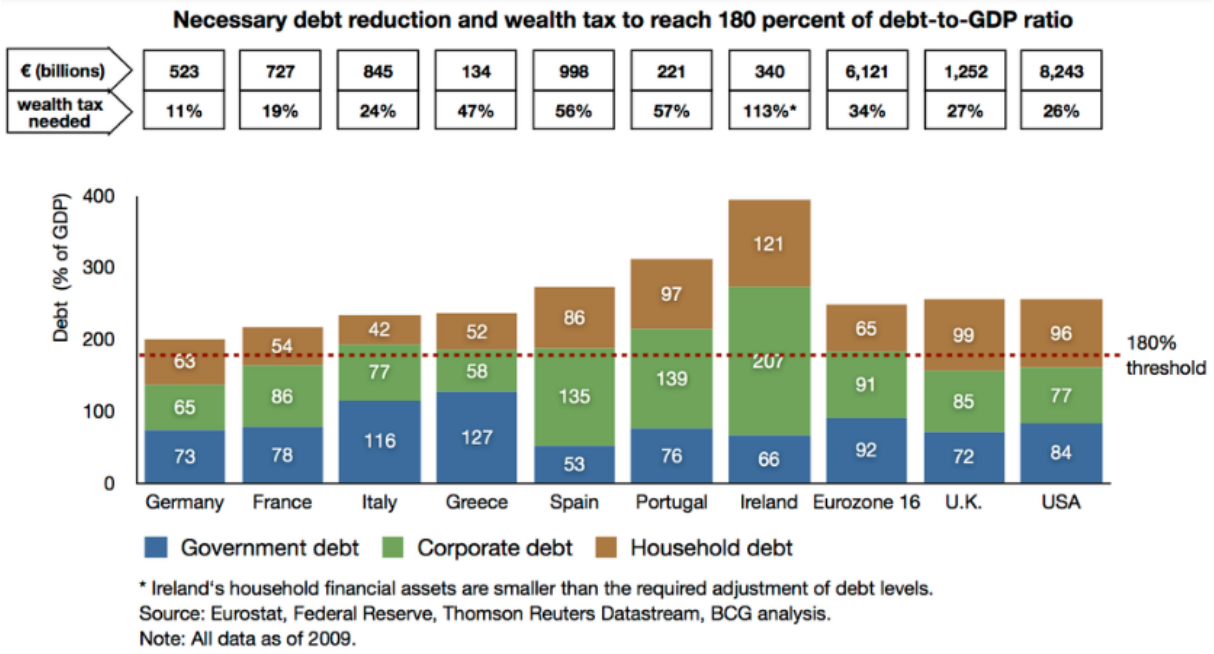



**Divergent sovereign borrowing costs**

Cut to July 2022, and the eurozone today is again staring at a potential replay of the crisis it was engulfed with a decade ago. The differential between yields on government debt of a group of "vulnerable" peripheral eurozone member states and those on Bunds has widened significantly recently.

Italy was recently forced to pay the highest borrowing costs on its debt since the 2012 eurozone debt crisis. Rome issued five- and 10-year bonds worth a combined €6bn on June 30 at yields of 2.74% and 3.47% respectively, having last auctioned equivalent medium- and long-term paper at higher yields in 2013 and 2014. Similarly, the spread on 10-year Greek and Spanish sovereign bonds hit almost 262 basis points and 126 basis points, respectively, on June 15.

Figure 8:




Debt increased faster in Southern countries because these nations had the greatest development needs.

From 1999 to 2008, interest rates for Southern European countries significantly decreased due to the introduction of the euro. This decline led to a substantial increase in corporate and household debt in these regions.

It is important to note that although interest rates declined between 1992 and 1999, this trend reversed after that period, creating less favorable borrowing conditions for Southern countries compared to the North.

The contraction of private debt in the South post-1999 raises questions, especially since interest rates were similar across countries at the time, highlighting the complexity of regional debt dynamics.

### 3.2.3 Role of the Central Bank and Interest Rates:

The refinancing rate is the cost for banks to borrow money from the central bank.

A central bank sets the base interest rate, known as the refinancing rate, which is crucial in the financial system as it determines borrowing costs for governments, and consequently, for businesses and households.

This rate is set by considering various economic factors, including inflation. Banks borrowing from the central bank influence the interest rate charged to governments, which in turn affects national borrowing costs.

Investor perception also plays a key role: when a state is seen as a safe option, its borrowing rate often aligns closely with the refinancing rate, provided the risk of default is perceived as low.

### 3.2.4 The Link Between Interest Rates and Inflation:

The central bank's primary mission is price stability.

A central bank adjusts the refinancing rate primarily to maintain inflation at a reasonable level, typically around 2-3%. A high refinancing rate can help reduce inflation, while a lower rate can encourage inflation.

Although opinions differ on whether low inflation is essential, there is consensus that maintaining a positive inflation rate is important. When inflation rises, central banks typically increase the refinancing rate.

This interaction between interest rates and inflation creates a complex dynamic where alignment between the two is crucial for economic stability.

### 3.2.5 Correlation Between Borrowing Rates and Inflation:

There is a clear correlation between the refinancing rate, inflation, and public borrowing rates.

Central bank refinancing rates are directly influenced by inflation, which subsequently impacts public borrowing rates. While the relationship is not strictly proportional, trends show that higher inflation often leads to higher refinancing and borrowing rates.

#### 3.2.5.1 Inflation's Impact on Debt:

Inflation reduces the burden of debt, making repayment easier with increased income.

High inflation reduces the real value of debt for borrowers. For instance, a company that borrows to raise wages and dividends can simultaneously increase the prices of its products. Although household incomes rise proportionally, this does not necessarily result in tangible economic growth since production levels remain unchanged. This mechanism allows debt-to-revenue ratios to decline, making state debt repayment easier in an inflationary environment.

#### 3.2.5.2 Interest Rates and Inflation in the Eurozone:

The European Central Bank (ECB) faces challenges in maintaining consistent inflation rates among member countries due to economic disparities."

Real interest rates within the Eurozone vary across financial markets and depend on inflation levels. Before the euro's introduction, each country managed its own monetary policy, resulting in varied borrowing rates. Since 1999, with the ECB, these rates have been more uniform but fail to account for fundamental differences among member states.

The ECB focuses on inflation control and avoids directly rescuing individual states facing financial difficulties.

### 3.2.5.3 Inflation's Impact on Purchasing Power:

Inflation has eroded purchasing power. Inflation reduces purchasing power, especially affecting investors. When investments are repaid, their value is often diminished due to rising prices.

For example, if someone lends money to buy shoes, they may find after three years that the price of shoes has risen, making the original repayment amount insufficient. Inflation must therefore be factored into interest rate calculations to ensure adequate loan compensation.

### 3.2.5.4 Borrowing Rates and Country Risk:

Each state has its own borrowing rate, distinct from others. Borrowing rates vary between states due to differences in inflation risk and default likelihood. During 1999-2008, investors failed to adequately consider these varying risks, despite significant economic differences between Northern and Southern European countries.

### 3.2.5.5 Understanding Financial Markets:

A deeper dive into how financial markets operate is needed to understand these dynamics.

To understand financial markets, it is critical to recognize that each state has a unique interest rate based on specific criteria. While the refinancing rate is uniform, borrowing rates must reflect individual country risks.

Investors must evaluate each situation case by case, but misjudgments can lead to market dysfunctions.

Interest Rates in Northern and Southern Eurozone Countries, And its roles in the euro zone crisis:

Repurchase agreements (repos) are temporary transactions involving the exchange of securities for liquidity.

Repos are a form of financing where one party sells securities while agreeing to repurchase them later. Legally structured as two opposite transactions over time, they allow financial assets to be refinanced while negotiating an interest rate between the securities lender and the liquidity provider.

Nominal interest rates in the eurozone were similar across the north and south.

From the euro's introduction until the 2008 crisis, real interest rates favored southern countries due to higher inflation compared to the north. This led to lower real borrowing costs in the south, despite similar nominal rates.

Financial markets set interest rates based on the European Central Bank's (ECB) refinancing rate, adjusting for risks such as default and inflation. However, markets often assessed these risks uniformly within the eurozone, despite significant inflation differences.

Inflation risks are perceived differently depending on the countries where funds are invested.

In a single-currency system like the euro, inflation risk is blurred, as investment funds pool euros from various countries. Investment evaluations rely on average eurozone inflation, masking inflation disparities between member states.

Default risk is another key factor, varying by country and evaluated using broad economic indicators, which are often imprecise. Rating agencies influence these evaluations but may rely on assumptions that fail to predict future outcomes accurately.

Financial markets knew the risks were not the same everywhere. Credit rating agencies assign grades (e.g., AAA), shaping perceptions of risk, particularly between southern and northern countries. Before the crisis, these ratings suggested differences in default risk.

A likely reason for uniform interest rates despite varying risks was the assumption that the ECB would intervene in crises, even though it was officially prohibited. This belief reduced perceived default risk for eurozone countries.

Releasing a significant amount of savings across the eurozone creates buying pressure.

The euro's introduction eliminated national barriers, enabling capital flows into southern countries with greater investment opportunities.

This inflow reduced interest rates, as the credit supply outpaced demand. Borrowers in regions with abundant credit enjoyed lower rates, leading to a convergence of interest rates between northern and southern Europe.

In practice, there are two creditors, Investors 1 and 2, who have agreed to lend to the bank.

Banks often have multiple creditors, including central banks. Each creditor adds complexity to the bank’s debt structure.

Investors lend at 5% interest, believing the rate reflects the risks of default. Reducing perceived default risk could enable banks to borrow at lower rates.

Investor 3 is funded solely by household deposits. Investor 3 uses client deposits to purchase government bonds, particularly French ones, yielding 3% annually.

The bank borrows these bonds from Investor 3 at a higher rate (e.g., 3.5%), enabling access to assets at a lower upfront cost while paying slightly higher interest.

Investor 2 now holds a guarantee, known as collateral. Repos provide Investor 2 with the right to sell bonds if the bank defaults, reducing default risk and encouraging lower interest rates (e.g., from 5% to 0.25%).

For the bank, this reduces financing costs while still satisfying Investor 3 with attractive rates.

These arrangements connect banks and investors so intricately that trust erodes during crises.

While beneficial in stable markets, such financial structures can exacerbate risks during crises, spreading contagion and eroding market trust.

Default risk varies widely between countries, yet rating agencies often assign higher ratings to riskier southern countries.

The euro's introduction facilitated investment in southern countries, lowering their interest rates to levels closer to northern counterparts.

Under no circumstances can the ECB use its monetary sovereignty to finance a government.

ECB rules prohibit direct financing of member governments, unique within the eurozone. This policy has led markets to downplay default risk.

Compared to the economies they support, European banks hold massive balance sheets, continuously seeking profit maximization.

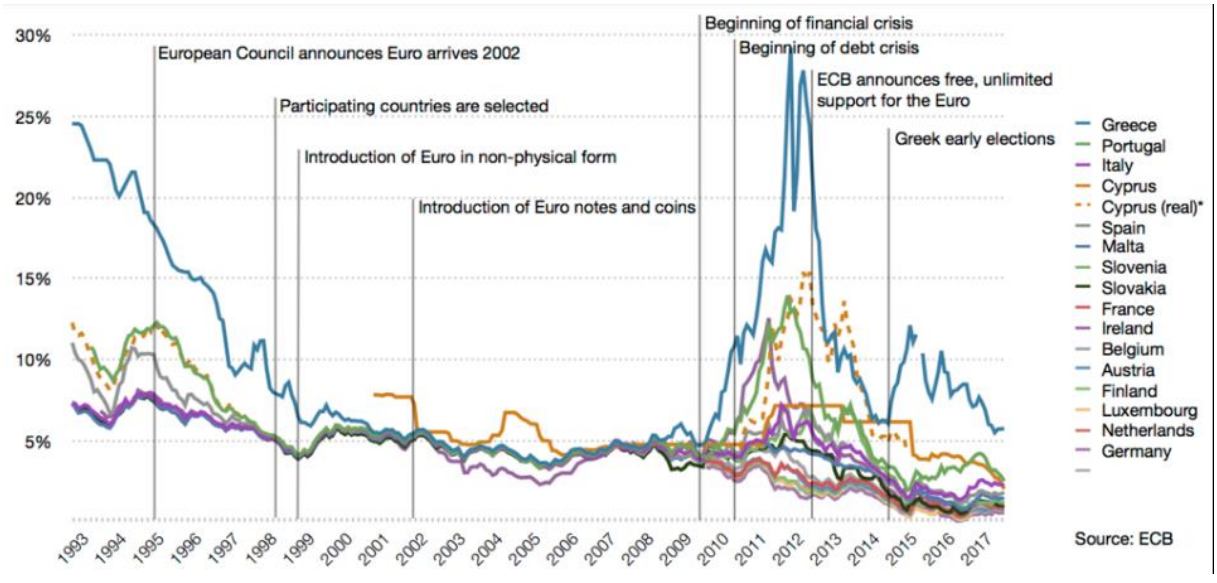
The solution to lowering rates is twofold: shorten loan terms or use collateralized loans.

Banks reduce rates by offering shorter-term, lower-risk loans or using collateralized loans.

The euro's integration standardized sovereign debt, making collateral more consistent in quality. Investors began purchasing debt not just for interest returns but for its resale or collateral value.

### 3.3 Understanding the Divergence in Interest Rates After the Lehman Brothers Collapse:

Figure 9:



**The Pre-2008 Convergence of Interest Rates.** Interest rate convergence in the Eurozone was fueled by the free flow of capital and the perception of sovereign debt as a safe asset:

Before 2008, interest rates across Eurozone countries were strikingly similar due to two main factors. Firstly, the free flow of capital allowed northern countries to invest in southern debt, lowering interest rates in the latter to levels comparable to wealthier nations.

Banks used Eurozone government debt as collateral for financing, assuming the quality of German and Greek debt was equivalent, which kept rates uniform.

Sovereign debt was viewed as the least risky financial asset. Investors believed the European Central Bank (ECB) would intervene to support struggling states, reinforcing this perception of safety. The collapse of Lehman Brothers in September 2008 triggered a financial confidence crisis:

Lehman's failure exposed deep interconnectedness among banks, causing uncertainty about potential losses. Banks became hesitant to lend to each other, stalling the essential credit flow.

Banks struggled to assess their exposure to other institutions' risks, amplifying mistrust and destabilizing financial networks.

With many banks already facing subprime-related losses, their ability to assess their partners' survival prospects diminished further, leading to a credit market freeze.

Central banks acted as lenders of last resort to prevent systemic collapse:

To restore confidence, central banks stepped in to provide liquidity, as banks ceased interbank lending.

Programs aimed to stabilize financial markets rather than directly stimulate the real economy. While markets were supported, challenges for financial institutions persisted.

Despite interventions, the path to recovery remained slow, with banks grappling with operational difficulties.

The bankruptcy of Lehman Brothers spotlighted the risk of default:

The collapse led to a reassessment of default risk in financial markets, particularly for sovereign debt.

Previously deemed reliable, financial instruments like Collateralized Debt Obligations (CDOs) tied to subprime mortgages revealed vulnerabilities, resulting in significant value losses.

Countries with lower credit ratings experienced the fastest increases in interest rates:

Amid global financial uncertainty, investors questioned the viability of sovereign debt, especially in the Eurozone.

Greece, with already poor credit ratings, saw its borrowing costs skyrocket as fears about its ability to repay debts intensified.

Perceived risk disparities led to steep interest rate increases for weaker economies, exacerbating their financial challenges.

The flight to quality weakened struggling nations while bolstering developed ones:

Safe Haven Investments: During crises, investors shifted funds to perceived safer assets like U.S., German, or French bonds.

Virtuous Circle for Developed Countries: Safer nations benefited from lower borrowing costs, while vulnerable economies faced selloffs of their debt, worsening their economic conditions.

Reinforcing Perceptions: The sell-off of struggling countries' debt signaled excessive risk, deterring new investments.

**3.4 The Impacts of the Financial Crisis on Greece:**

Greece was the first country to request financial aid from the Troika in May 2010, as its government could no longer finance itself on the financial markets.

The image people have of the Greeks, often oversimplified, tends to create prejudices, like the idea that they are "privileged" and not working enough.

However, statistics show that Greeks work an average of 8 hours per day, which is longer than the average in other OECD countries, such as Germany and France.

Moreover, the minimum retirement age in Greece is 65, like other eurozone countries, and not significantly lower as often perceived.

The Greeks are champions of military spending. Tax evasion is a well-known problem in Greece, but it is also essential to note that the country has the highest defense budget in the eurozone, spending an average of 2.7% of its GDP on it, compared to countries like France.

However, when looking at the overall Greek state budget, it ranks fifth in terms of public spending compared to other European countries.

Starting from 2008, with the global financial crisis following the collapse of Lehman Brothers, Greece suffered from the anticipation of the crisis by financial markets, which exacerbated its financing difficulties.
It becomes more expensive to borrow for those struggling, while it's the opposite for the already strong.

European investors find it easier to avoid countries like Greece, which represents only a small portion of the sovereign debt market in the eurozone.

The size and wealth of a country influence investment decisions. For example, France, with its large population and high purchasing power, is perceived as an essential investment destination.

Countries with a small GDP and low population, such as Greece and Portugal, are more likely to be avoided by investors, affecting their ability to raise funds.

Greece is at the bottom of the table in terms of population and GDP per capita.

In 2007, Greece ranked among the least favored countries in Europe in terms of population and GDP per capita.

While its unemployment rate was high, just over 8%, it was not in a critical position compared to other countries.

However, this unemployment rate was a concerning indicator for the economy.

Here, it’s very clear: Greece is the worst off in terms of public debt.

Greece has a public debt ratio that far exceeds the 60% of GDP threshold, a limit set by the Maastricht Treaty.

Other European countries, such as Italy and Belgium, did not adhere to this limit, but Greece's situation is particularly alarming.

Before joining the euro, the country hid its true level of debt through questionable financial practices, including derivatives products offered by institutions like Goldman Sachs.

The public deficit of eurozone member states must not exceed 3% of their GDP.

In 2007, Greece exceeded this criterion with a significant deficit, while other countries like Italy and Portugal also violated the 3% rule.

Although Greece had alarming deficit levels, other European countries, even historically, have also regularly exceeded these thresholds.

Greece’s falsification of deficit figures in 1999 enabled its entry into the eurozone, but it planted the seeds of future problems.

Greece ranked last among eurozone countries in 2007.Greece suffers from a lack of complexity in its production, meaning it mainly produces goods that could easily be made elsewhere.

Countries with more complex production, like Japan and Germany, succeed in generating high-quality, high-value-added products.

This lack of diversity in production and innovation leads to increased economic dependency and vulnerability in the face of global crises.

There is public investment in the country, but why would Europe impose an austerity plan if it means slowing down this investment?

Public investment is crucial for a country's growth as it allows spending beyond what is earned to create a prosperous future. For example, a person wishing to buy an apartment will need to borrow money, which increases debt.

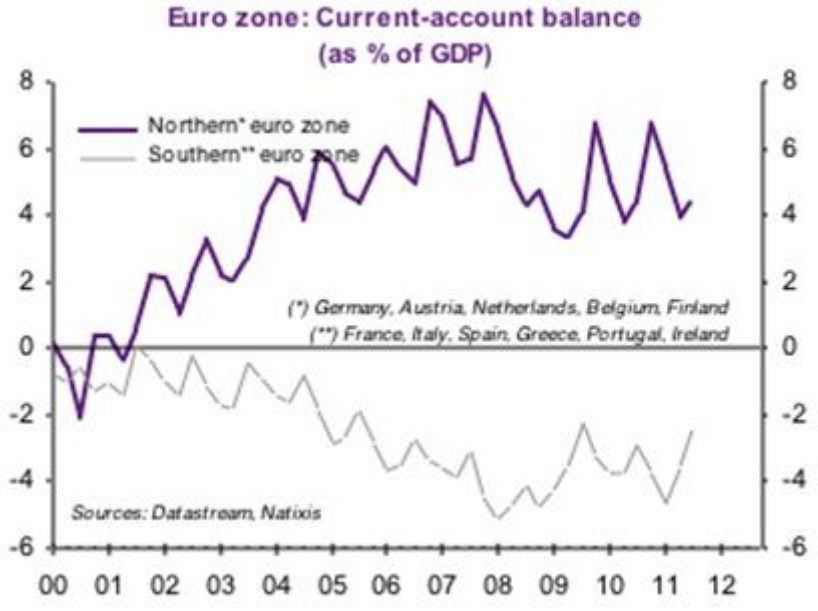
Although this borrowing might seem negative at first, it is essential for creating wealth. When households are considered together, overall debt increases, enabling continuous investment in assets like houses or cars, which is beneficial for the economy.

Companies and the state function on the same principle, often borrowing to finance investment projects that, in turn, support the economy. This process is not necessarily bad if it is not speculative.

The creation of money by banks also allows overcoming limits on available funds, enabling high levels of investment and continuous economic growth.

Figure 10:

**Misconception of Public Deficit**




Liberal thought holds that public investment must be minimized.

Liberal thought promotes the idea that private investment is more efficient than public investment due to its presumed profitability. However, some essential services like justice or defense cannot be measured in

terms of profitability as they need to be accessible to everyone, ensuring the proper functioning of the private sector.

The common belief that private management is always more profitable than public management is questionable. The effectiveness of management depends on many factors, including the quality of available talent and the organization of activities.

Comparing public and private institutions solely based on financial profitability is oversimplified. For example, saving more lives in a public hospital, even if it runs at a deficit, could be considered a more valuable long-term investment than generating profit in a private hospital.

Austerity is imposed on Greece because it is assumed that public investment is necessarily a burden.

Austerity was implemented under the assumption that excessive public deficits harm the economy. This principle is based on a flawed view of economic dynamics where households anticipate tax increases due to state deficits, pushing them to reduce consumption and investment.

This theory, though widely accepted, has proven inaccurate in practice, especially in the Greek case, where austerity measures have been disastrous for the economy. Households and businesses do not act like financial analysts, which calls into question the validity of deficit-based predictions.

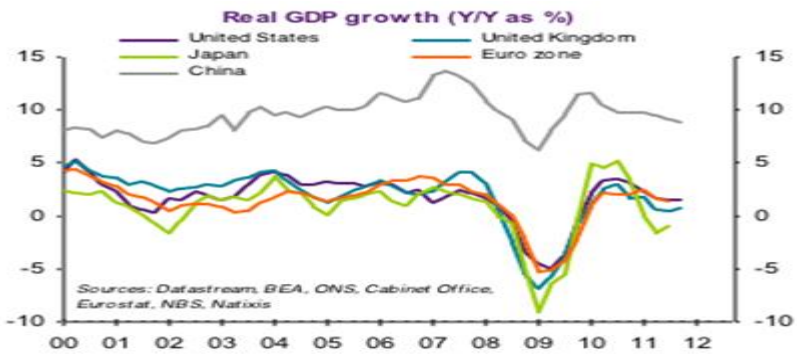
**Ricardian Equivalence Theory and Its Criticisms**

The Ricardian equivalence theory needs to be revised by its proponents.

The Ricardian equivalence theory, often seen as abstract, is based on empirical studies from countries like Denmark, Ireland, and Australia in the 1980s. However, its application in macroeconomics is contested as it is difficult to conduct controlled experiments in environments where many variables interact in complex ways.

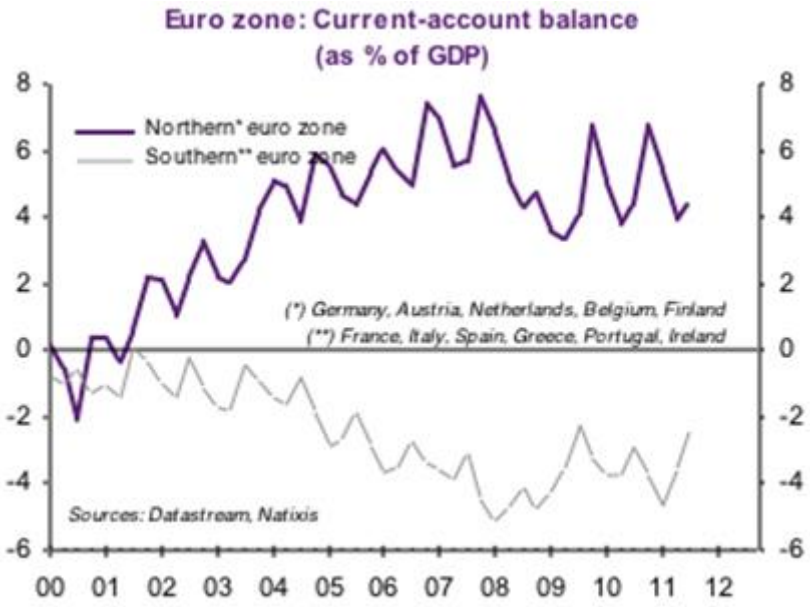
Many macroeconomists argue that reducing the public deficit can lead to economic development, but it is erroneous to think that these two elements are necessarily linked. Other variables can influence economic outcomes, obscuring the real impact of such reductions.

Figure 11:



Now if you look inside the eurozone, you will observe interesting disparities. First, in terms of balance of payments, there is a clear divide between countries of the north of the euro area (Germany, Austria, The Netherlands, Belgium and Finland) which post a (rising) current account surplus and countries of the "South plus Ireland" (France, Italy, Spain, Greece, Portugal, Ireland) which have a current account deficit.

Figure 12:




Clearly, countries in the south have been living beyond their means. By spending more than they produced, they gave birth to a fundamental disequilibrium inside the eurozone which is at the core of the current crisis.

Two explanations to this phenomenon can be drawn from both sides of the macroeconomic equilibrium:

On the demand side, from the birth of euro up to the financial crisis (2008), investors have been underpricing the risk: default risk on Government bonds were being considered as practically nonexistent in all Member States: therefore, the spreads vis-à-vis the German bunds remained near zero.

There was therefore a strong incentive to spend (public and private) and invest in housing: hence housing bubbles in Ireland and Spain. Overspending was the consequence of too low interest rates which were a consequence of the mispricing of risk by the markets.

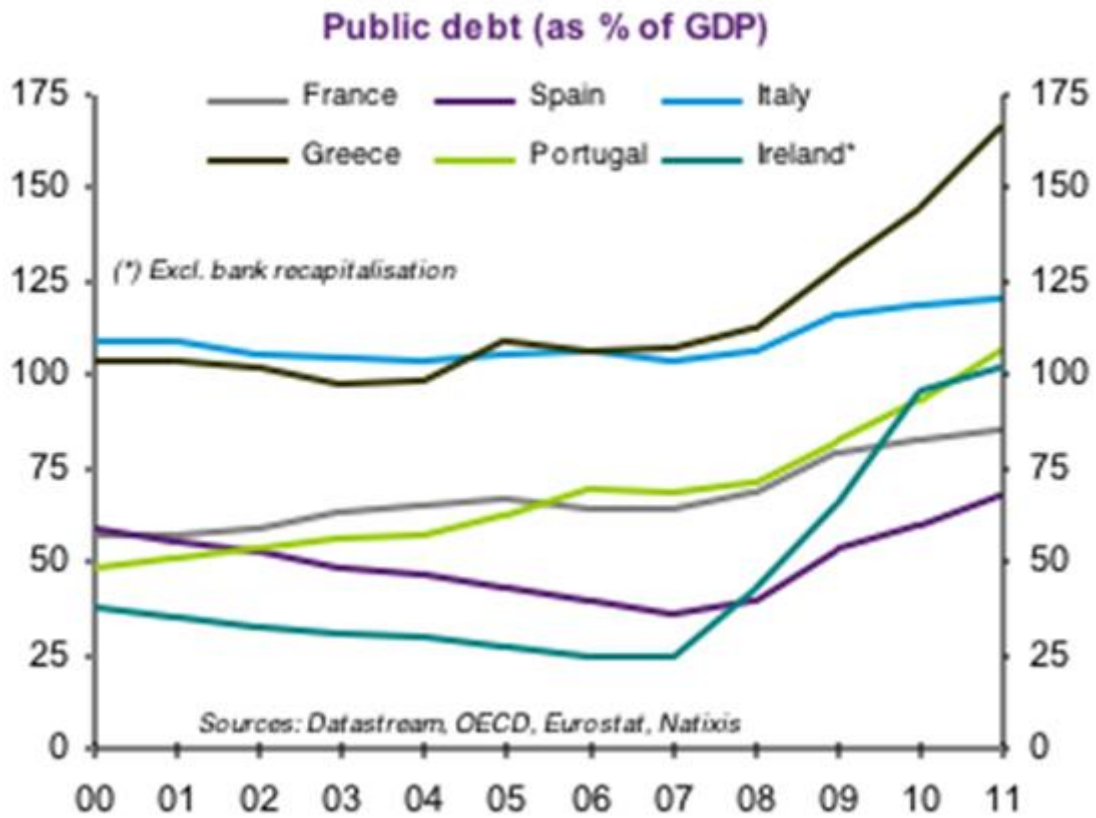
But there was also another origin which can be found on the supply side: these current account disparities reflect also discrepancies in competitiveness.

Enshrined in the Maastricht Treaty and later detailed (in 1997) in the so-called "Stability and Growth Pact" were the two ceilings of 3% of fiscal public deficit to GDP and 60% of public debt to GDP ratios, which each Member State was required to abide by. But due to poor enforcement procedures, these rules have been violated, even by Germany and France. Worse, during the world financial crisis in 2007-2009, to avoid the world economy to fall into a depression, governments were incited by international bodies (the

IMF or the G20), in the pure Keynesian tradition, to expand public expenditures and accept, at least temporarily, higher budget deficits.

No wonder that in Europe, as you see in the graph, there is an upward move in the rate of public debt increase after 2007. It is telling that this acceleration is more pronounced in the peripheric countries which later have been hit by the euro crisis.

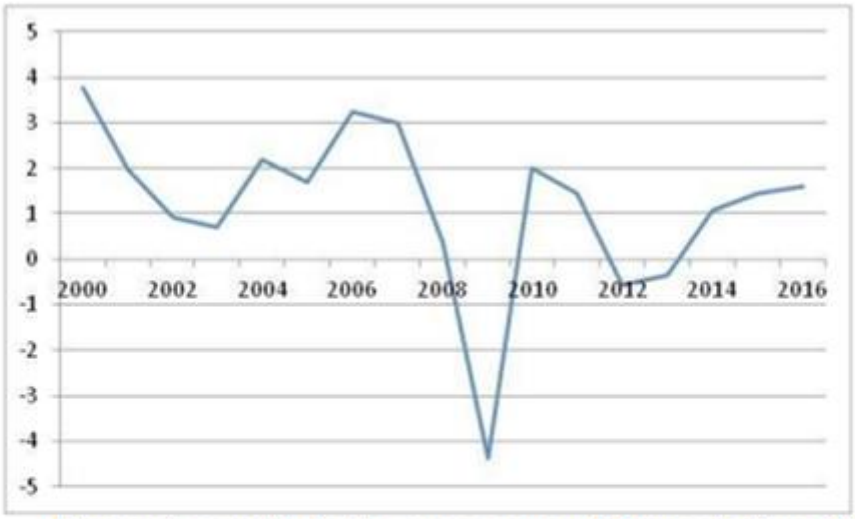
Figure 13:




Let us now have a look at the performance of the euro since its inception in 1999. Two periods need to be considered: from 1999 to 2009, the euro performed remarkably well, whereas since early 2010 the eurozone entered a crisis which is less about the euro itself than about the public indebtedness of some of its Member States.

The successful years: 1999-2009, during its first decade of existence, the European currency fared remarkably well: its inception which was a perilous exercise took place without any hitch. During all this period, the price level remained stable; the value of the euro on the foreign exchange remained strong. In terms of economic growth, the eurozone economy compared favorably with the other OECD countries.

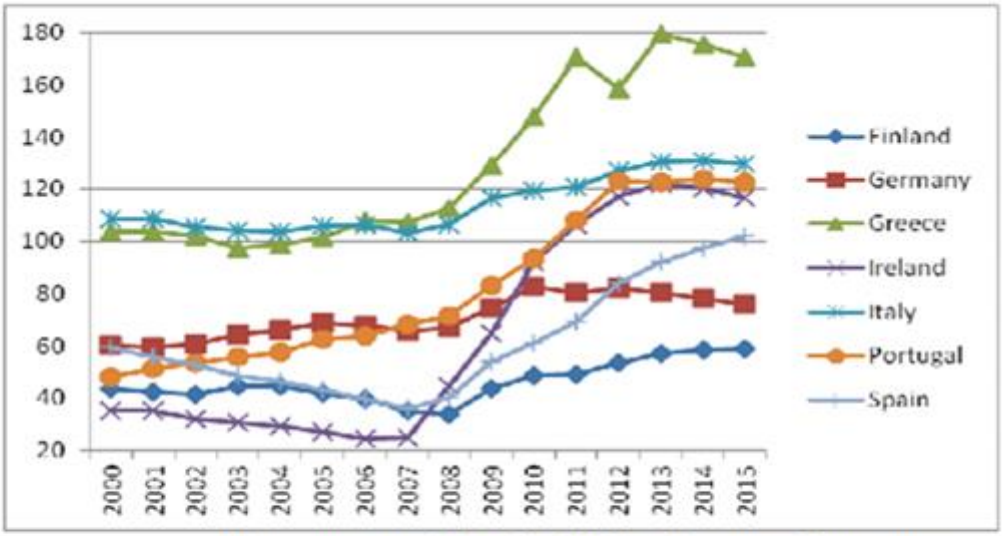
Figure 14:




Economic growth in the euro zone and forecasts from 2013 to 2016

*Source: International Monetary Fund, World Economic Outlook Database, April 2013.*

Figure 15:




Government debt (% GDP) of some Euro area countries

*Source: International Monetary Fund, World Economic Outlook Database, April 2013.*

### 3.5 The Consequences of the Housing Bubble in Ireland:

Real estate prices collapsed, and the construction sector saw the largest decline during the subprime crisis. Ireland experienced a real estate bubble that burst following the subprime crisis, resulting in massive economic losses. Property prices plummeted dramatically, worsening the situation. This drop in prices led to mass layoffs in the construction sector, causing unemployment to rise and slowing the country's economy.

The consequences of this crisis were particularly severe in Ireland, where the economy was heavily dependent on construction, leading to a downward spiral in economic activity.

Half of the increase in unemployment is solely due to job losses in the construction sector. Between 2007 and 2010, Ireland's construction sector lost 150,000 jobs, representing 5% of the working-age population. This crisis heavily contributed to the increase in unemployment, which spiked by ten percentage points during the same period.

The graph shows that half of the Irish economic crisis was due to the collapse of property prices, while the other half was related to a global economic slowdown affecting various sectors and countries. These banks accumulated €415 billion in debt between them In 2007, Ireland's three largest banks had combined balances reaching €462 billion, but with only around 10% capitalization, they were highly exposed to bankruptcy risk.

To illustrate the gravity of the situation, it would require taking the income of the Irish population for two and a half years to repay these banks' cumulative debts.
In comparison, the debt levels of banks in the United States relative to GDP are much less concerning because the U.S. has a larger economy.

Irish banks, in addition to betting on subprime in the U.S., financed real estate investments in Ireland. When the housing bubble burst, Irish banks found themselves in a difficult position as many of the financed investments failed, leading to significant losses. These losses, though on paper, could only be offset by shareholder capital.

The banks' bankruptcy crisis began in 2008, but it was in 2010 that the Irish state had to step in to save these institutions, further deepening the public debt.

Ireland's public debt exceeded 123% of GDP in 2010. Following the banks' collapse and the rise in public debt, Ireland had to call in the Troika for an austerity plan.

Between 2008 and 2010, public debt exploded, moving from a generally healthy position to a record deficit, reaching 32% of GDP in 2010.

While austerity was implemented to restore public finances, signs of recovery began to appear in 2012 with a decrease in unemployment and net job creation, which intensified in 2013. What matters is investment, whether public or private.

Ireland's economic recovery seems to be linked to a thriving private investment sector after 2013, even though public spending decreased.

The graph showing the evolution of private and public debt shows that the acceleration of private investment allowed the Irish government to reduce its spending, helping stabilize the economy. In contrast, Greece's situation is different, as its economy was more dependent on public investment, leading to difficulties during austerity periods.

Austerity in Ireland did not undermine the role of the government in the economy nor the benefits already enjoyed by businesses.

Ireland had naturally balanced economic structures before the 2008 crisis, which facilitated the recovery process.
While the government increased its social public spending, it ensured that private investments continued in thriving sectors like consulting and programming, compensating for the loss of jobs in construction. The quality of infrastructure, a well-educated population fluent in English, and favorable taxation made Ireland an attractive destination for international companies even after the crisis. Unlike Greece, where austerity had devastating effects, Ireland managed to maintain a relatively stable budget balance during difficult times, avoiding large cuts in public spending.

Ireland's debt quadrupled between 2007 and 2013, with a large part of this increase related to the bank bailout.
Between 2007 and 2013, Ireland's debt rose from €45 billion to €150 billion, largely due to government efforts to rescue the troubled banking system.

This bailout was controversial because the Irish government was not required to fully assist the banks, raising questions about the political decisions made at the time.

The government could have chosen a more targeted bailout approach, like Iceland, to minimize the financial impact on the state.

The need to resort to the Troika in 2010 was exacerbated by a record public deficit, while the country had previously been a model of economic stability.

Austerity can only work in a country that had already been somewhat applying it before the crisis. A striking contrast can be seen between the economic situations in Ireland and Greece. Ireland adopted austerity measures that did not alter its social model, while Greece suffered drastic cuts in public spending. In Ireland, public spending in 2013 was equivalent to that of 2006, showing resilience in its economic model, while in Greece, public spending was reduced to 1999 levels, resulting in significant losses in social benefits.

The lessons from Ireland's austerity highlight why measures like the bank bailout were deemed necessary, contrasting with Greece's political choices that proved less effective and more destructive.

**3.6 The € Crisis Part:**

Analysis of Economic Attractiveness and Its Impacts. The representation in the form of bubbles is supposed to summarize attractiveness in terms of private investments.

Ireland is wrongly placed among the southern countries, as it should be in the northern category due to its economic characteristics.

The analysis of the effects of the economic crisis highlights that Greece and Portugal are similarly classified due to their low complexity, small population, and limited wealth production.

Spain is better positioned, while Italy should have fared better than the other countries for similar reasons.

Ireland, on the other hand, should not have been severely affected by the crisis, given its economic characteristics that place it in a different category.

**Evolution of Unemployment and Financial Aid** I will base myself on two criteria: the increase in the unemployment rate and the financial aid provided by the Troika.

Despite initial comparisons, Greece recorded the highest unemployment rate, followed by Spain, with Ireland and Portugal competing.

It is noted that Spain's status as a country with high unemployment but low financial aid highlights complications in ranking the impacts by country.

**Capital Flight and Private Debt** The stop in investment results in a decline in company revenues, which are forced to lay off employees.

An analysis of private debt levels shows that since 2008, debt has either stagnated or decreased in southern countries, while it continues to rise in northern countries.

This slowdown in debt accumulation is accompanied by a reduction in risky investments, negatively impacting poorer countries.

Consequently, these changes create an economic cycle where layoffs and reduced consumption mutually reinforce each other, exacerbating economic crises.

**Case of Ireland** the Irish crisis has nothing to do with capital flight.

Ireland is portrayed as a country that experienced a more intense crisis due to a speculative real estate bubble that caused the collapse of its banking sector.

Its intervention by the Troika in 2010 was the result of the rapid deterioration of its financial situation, driven by rising unemployment and the urgent need for economic support.

Unlike southern countries, Ireland underwent a crisis due to a housing bubble rather than economic attractiveness issues.

**Case of Spain and Real Estate Issues** in Spain, there were many newly built housing developments that were completely empty.

A real estate bubble even more dramatic than Ireland's emerged in Spain, causing massive unemployment when the burst of this bubble made construction projects unprofitable.

Despite the similarities, Spanish banks managed to withstand better due to their international structure, limiting losses after the real estate crisis.

This contrasting situation shows how the nature of debt and investment varies from country to country, significantly influencing their resilience during the crisis.

**Spanish Savings Banks and the Credit Crisis** Spanish savings banks financed about half of the real estate loans in Spain.

Spanish savings banks play a crucial role in financing real estate, representing about 50% of all loans in this sector. This makes them more vulnerable in times of crisis when excessive debt becomes common, quickly deteriorating the bank's health. "They are more capitalized than Irish banks, so better prepared to absorb losses."

Although they are more capitalized than their Irish counterparts, Spanish savings banks masked some of their risk exposure through questionable accounting practices, making their stability appear more genuine than it was. The bank goes to the repossessed site, but it doesn't cancel the debt.

Unlike the American system, where selling a house can cancel the debt in case of non-payment, in Spain, even after a foreclosure, the debt still exists. This creates a difficult situation for borrowers who remain responsible for the full amounts owed, even when the value of their real estate has dropped.

**Capitalism Feedback Loops** Capitalism generates feedback loops that can lead to financial crises.

Capitalism is inherently dynamic, creating cycles of confidence and panic. During periods of confidence, it promotes economic growth. However, during overexcitement, it can trigger speculative bubbles, especially in economic zones where capital circulation is facilitated using the same currency.

This volatility of investments can encourage growth, but a lack of homogeneity in economic development between countries increases the risk of speculative bubbles. Investors may then develop exaggerated expectations about a particular country or sector, exacerbating market instability.

**Risks of Capital Flow Freedom** In a crisis, a country perceived as weak attracts fewer investments, worsening its situation.

When a crisis occurs, the irrationality of panic effects can worsen a country's vulnerability, making it even weaker due to massive disinvestment. To avoid this, it would be prudent to be cautious before creating areas of free capital flow coupled with a single currency, despite the benefits they may bring.

Anticipating potential deficits, a protection system against investment volatility should be considered to limit these dangers. This remains a topic to explore further in future discussions.

**Contrasting Situations: Italy and Other Southern Countries** Italy is divided between a wealthy north and a poor south, complicating its economic situation.

Italy, unlike other southern countries like Spain and Ireland, has experienced varied crisis trajectories. While Spain and Ireland faced speculative bubbles, Italy represents a case of economic self-separation. The country struggles with a significant gap between its northern and southern regions.

Data on unemployment between 2010 and 2013 clearly show that southern Italy fared worse than the north, a historical trend exacerbated by the flight of capital from less developed regions, leading to bankruptcies and unemployment.

**Public Debt and Its Impact on Italian Banks** Italy quickly saw its debt become a major problem, rivaling that of Greece in 2007.

Italy's public debt reached alarming levels, like Greece's before the crisis. This level of indebtedness, combined with the capital flight from the south, unsettled the financial markets and contributed to the worsening economic situation.

Meanwhile, Italian banks, facing a generalized crisis in the banking sector, were not the only ones affected. Other southern countries like Portugal and Greece also faced similar difficulties due to massive job losses and business bankruptcies, worsening their banking situations.

**Definition of Manufacturing and Industry** Manufacturing includes all jobs related to factory production.

Manufacturing encompasses all trades related to the production of goods in industrial environments. This includes sectors such as automotive, furniture, pharmaceuticals, beverages, clothing, etc.

In contrast, industry includes extractive activities like the extraction of hydrocarbons and coal, as well as the production and distribution of water and electricity, including waste management.

**Outsourcing and Automation of Factory Jobs** Factory jobs are progressively outsourced to countries with cheaper labor.

Europe, transitioning to a service economy, has seen many factory jobs transferred to regions with lower labor costs. This trend is accompanied by an increasing threat to remaining jobs, especially those that are more skilled and face automation.

Since 2000, layoffs in the factory sector have intensified, with particularly severe impacts in southern European countries, where outsourcing is easier due to often less-skilled jobs.

**Impact of Economic Crises on Jobs** Factory layoffs are preferred over service jobs.

During economic crises, such as the subprime and euro crises, companies often prefer to close factories rather than reduce staff in services. This contributes to a significant increase in unemployment in the factory sector.

For example, the southern eurozone lost more than 3.7 million jobs, highlighting the increased vulnerability of basic industries to economic fluctuations.

**Consequences for the Retail Sector** The closure of jobs in construction affects retail sales.

The drop in factory workers in construction leads to a reduction in household spending, directly impacting local commerce, large retail chains, and hospitality and restaurant industries.

Therefore, economic crises lead to a vicious cycle where the drop in sales forces the retail sector to lay off workers.

**Differences Between EU Countries in Facing the Crisis** Countries are classified by their development level and GDP per capita.

Using a complexity index developed by Harvard, it's observed that countries like Greece and Portugal are particularly financially vulnerable in a common monetary framework where the free movement of capital prevails.

As the crisis progresses, the response of governments varies, but southern countries suffer from more drastic austerity measures than northern ones.

**Impact of the Crisis on the Retail Sector** The retail sector is always impacted when consumption slows down.

The crisis particularly affected the construction sector, but its impact was even more significant in southern countries. In these regions, the retail sector also suffered heavily, as commercial activities are directly linked to household consumption.

When consumption in a country slows down, local commerce and large retailers immediately feel the drop. This results in a significant reduction in their revenue, leading to layoffs due to economic austerity measures.

**3.7 Milton Friedman in Trouble. The Dangers of Monetary Creation According to Milton Friedman:**

Friedman warned that if new money is injected into the economy, it inevitably leads to inflation.

Milton Friedman, a key figure in the monetarist movement, raised concerns about the excesses of monetary creation. In his analysis, he established that increasing the money supply could either lead to higher prices or increased production. However, he argued that injecting money without a corresponding increase in production inevitably causes inflation.

The fundamental monetarist equation states that the money supply, multiplied by the velocity of money, must equal the total production of goods, multiplied by the general price level. This relationship explains how changes in the money supply affect prices.

**The Velocity of Money and Its Impact:** The velocity of money is seen as relatively stable in the medium term.

The velocity of money is a central factor in Friedman's model, as it is assumed to be stable in the medium term. This means that the way economic agents enter and exit the monetary circulation is predictable, allowing for estimates of the impact of monetary variations on prices.

Friedman postulated that any increase in the money supply should not influence production but should rather lead to higher prices. This leads to inflation if the money supply increases without a corresponding increase in production.

**Criticisms and Limitations of Friedman's Theory,** if Friedman's equation were true, prices should necessarily follow the money supply.

Although Friedman proposed that an increase in the money supply inevitably leads to inflation, data shows instances where this relationship does not hold. For example, a significant increase in the money supply in the Eurozone did not result in a corresponding rise in prices, challenging the validity of his model.

A major criticism is that monetary creation can also be linked to changes in production, especially when companies borrow to invest in new projects. In these cases, increases in production can paradoxically occur without inflation.

**The Impact of Monetary Creation on Inflation:** Monetary creation is not necessarily synonymous with inflation.

Monetary creation can be used to finance the production of wealth without necessarily causing inflation. It depends on how it is employed.

There is a distinction between financing demand and financing the production of wealth. Intuitively, one might think it's better to finance production directly to avoid economic complications.

In practice, a large portion of current monetary creation is directed towards financing demand, notably through mortgage loans or consumer credit. This indicates that the financial system prefers to stimulate demand rather than invest in production.

**Speculation and Asset Value,** this money circulating in real estate and financial bubbles is out of touch.

A significant portion of the money supply is devoted to speculation, which does not contribute to wealth production. This speculation manifests through the exchange of financial assets and already existing real estate.

Second-hand goods like cars or furniture are not accounted for in the official inflation calculation, which complicates the understanding of the actual impact of monetary creation on the economy. Financial and real estate products increase in value, attracting a growing portion of the money supply.

**Consequences of Debt and Economic Risks,** the increase in the money supply is associated with debt, which gradually becomes an unbearable burden.

When monetary creation is used for speculative purposes rather than wealth creation, it can lead to a situation where debt becomes unsustainable. Only new debt allows the old to be repaid.

Changes in economic agents' indebtedness can lead to crises when consumption is excessively stimulated. If this imbalance persists, it could jeopardize economic stability.

**Financing Production vs. Financing Demand:** The safest method is clearly financing production.

Direct financing of production seems to be an effective solution to reduce the risk of speculation, stabilizing the economy.

Financing demand increases the risk of inflation, speculation, or both. It depends on how economic agents react to increased consumption.

Financing that does not result in overconsumption could help stimulate production without disrupting the market.

**The Impact of Monetary Creation on Speculation:** Monetary creation has mostly financed speculation.

This section discusses the idea that since the establishment of the euro, and particularly since the beginning of the financialization of the economy, monetary creation has mainly been used to fuel speculation rather than to stimulate inflation or economic production.

It is emphasized that increasing the money supply is often perceived as inflationary, which has led to a withdrawal of monetary creation powers in favor of European institutions, limiting member states' ability to influence their own economies.

The critique focuses on the fact that the mechanisms of monetary creation, which are now largely controlled by the private sector, seem to have primarily speculative results, raising questions about the responsibility and regulation of this monetary creation.

**The Question of Regulating Monetary Creation:** Who should oversee this money printing press?

The discussion addresses the crucial issue of who should control the creation of money, and how this authority could ensure that the use of created money aligns with clear economic goals that benefit society.

It is important to consider the need for strong regulation to control money flows and prevent speculative uses that could harm the real economy.

**3.8 The Stakes of Cryptocurrency Investment, and will it be the next bubble?**

When you own Bitcoin or any other cryptocurrency, you only own a line of code, so the value depends solely on speculation.

Investment in cryptocurrencies like Bitcoin is considered a particularly risky bet due to their speculative value. Unlike traditional assets such as real estate or stocks, the value of cryptocurrencies is not tied to tangible goods or services.

The value of a cryptocurrency mainly depends on supply and demand. In an auction room, when the number of buyers exceeds the supply, the price increases; conversely, when there are more sellers than buyers, the price drops.

This market is highly volatile; for instance, price fluctuations of cryptocurrencies can reach +20% or -20% in a single day, showcasing their instability compared to other assets.

**The Challenge of Tying Cryptocurrency Value to Reality,** when it comes to financial products, they are often tied to companies that offer real goods and services.

While traditional financial products like stocks or real estate are often supported by concrete economic indicators, cryptocurrencies lack such anchor points.

As a result, it is difficult to assess the true value of a cryptocurrency since there are no tangible indicators to guide this evaluation.

Official currencies, however, benefit from legal constraints, making their value more stable. The lack of regulation for cryptocurrencies means demand could collapse overnight.

**Increased Volatility of Cryptocurrencies and CFDs:** The volatility of cryptocurrencies is a good indicator of risk, the higher the volatility, the greater the risk.

The high volatility of cryptocurrencies can lead to frequent gains or losses, often with significant variations. This volatility is exacerbated by the lack of real-world anchor points, making trend analysis even more complex.

Furthermore, using Contracts for Difference (CFDs) to trade these assets amplifies the risk because these derivatives allow one to bet on price movements without owning the underlying asset.

**Risks of CFDs and Leverage:** Leverage multiplies both gains and losses.

Contracts for Difference (CFDs) are financial instruments that can magnify both gains and losses through leverage. For example, if an investor bets on a rise in Bitcoin with a five-fold leverage, every price fluctuation is also multiplied. This means that if Bitcoin rises by 500 euros, the investor gains not just 500 euros, but 2500 euros. However, this same logic applies to losses: if the price drops, losses are also multiplied by the same factor.

**The Reality of Losses in CFD Trading.** Once the loss reaches zero, it is impossible to continue without reinvesting funds.

By investing just 100 euros in a CFD with leverage, an investor takes on enormous risk. If the market moves in the wrong direction and Bitcoin drops, for example by 4900 euros, the investor could lose the entire initial capital. If the funds fall below a certain threshold, the broker will require an additional deposit to maintain the position open, otherwise, the position will be liquidated.

**Scams in the Cryptocurrency Sector,** most promises of guaranteed returns on cryptocurrencies are illegal.

Beyond market risks, investors must also beware of potential scams. Offers promising very high and guaranteed returns on cryptocurrency investments should be approached with caution. No real investment product is currently registered with financial authorities, and scammers often exploit investor naivety with attractive promises.

Always check if a company is registered with the relevant authorities. Regardless of the investment strategy, it is essential to verify that the offer comes from a company registered with financial market authorities. This ensures that the entity is supervised and adheres to certain standards. Currently, no cryptocurrency offer meets these criteria, highlighting the importance of due diligence before investing.

### 3.9 Capitalism and Debt and interest rate dependencies:

Capitalism operates fundamentally on the concept of debt and credit, both as a financial mechanism and as a driver of economic activity. This reliance on debt is intertwined with the structure and functioning of capitalist economies. Here's how capitalism and the need for debt are connected:

#### 3.9.1 Debt as a Catalyst for Economic Growth:

In a capitalist economy, businesses and individuals often borrow money to invest in projects, expand operations, or fund consumption. This borrowing enables the creation of new goods, services, and infrastructure.

Entrepreneurs and businesses rely on debt to fund innovation. For instance, startups typically use loans or venture capital (a form of equity debt) to launch their products or services.

Borrowed money, when spent, creates jobs, income, and further demand, leading to a cycle of economic growth.

**3.9.2 Profit and the Need for Continuous Expansion:**

**Infinite Growth Model**: Capitalism operates on the premise of infinite growth, necessitating continual investment and reinvestment. Debt allows businesses to accelerate this process.

**Return on Investment (ROI)**: Companies often take on debt expecting that future profits will exceed the cost of borrowing. This need for debt is embedded in the pursuit of maximizing shareholder value.

**3.9.3 Consumerism and Personal Debt:**

Capitalist economies encourage spending to drive demand. Credit cards, mortgages, and personal loans enable consumers to spend beyond their current means, keeping the economy vibrant.

In many cases, wages have stagnated relative to the cost of living, making debt a necessity for maintaining a certain standard of living.

**3.9.4 Government and Sovereign Debt:**

**Stimulating the Economy**: Governments in capitalist systems often borrow to fund infrastructure, social programs, and stimulate economic activity during downturns.

**Deficit Spending**: National economies frequently operate on deficit spending, relying on debt to finance projects that boost long-term growth.

**3.9.5 Financialization and Speculative Debt:**

**Derivatives and Leverage**: The financial sector in capitalism often uses complex instruments like derivatives, which are forms of speculative debt, to generate profits.

**Bubbles and Crises**: Excessive reliance on debt can lead to economic bubbles, where asset prices are inflated due to borrowed money. The 2008 financial crisis is a notable example of this phenomenon.

**3.9.6 Critiques of Debt in Capitalism:**

**Debt Dependency**: Critics argue that capitalism fosters a system where individuals, businesses, and governments are perpetually indebted, benefiting financial institutions disproportionately.

**Exploitation**: The need for repayment with interest often leads to wealth inequality, as lenders accumulate wealth at the expense of borrowers.

**Environmental and Social Costs**: Debt-driven growth prioritizes short-term returns over long-term sustainability, exacerbating environmental degradation and social inequality.

### 3.9.7 Alternatives and Reforms:

**Debt Jubilee**: Some propose debt forgiveness programs or restructuring to alleviate the burden on individuals and nations.

**Post-Capitalist Models**: Advocates for socialism or other economic systems suggest reducing reliance on debt by focusing on collective ownership and equitable resource distribution.

**Sustainable Finance**: Movements towards green bonds and ethical lending practices aim to align debt mechanisms with sustainable goals.

In essence, debt is both a tool and a necessity within capitalism, fueling growth while perpetuating cycles of dependence and inequality. Balancing its use with ethical and sustainable considerations remains a significant challenge for contemporary economies.

### 3.10 What is a Bubble?

Debt and economic bubbles are closely intertwined in capitalist systems. Debt often fuels asset price increases, which can lead to unsustainable growth and eventually result in financial bubbles. Here's an exploration of the relationship between debt and bubbles:

A **bubble** occurs when the prices of assets (e.g., real estate, stocks, or commodities) rise significantly above their intrinsic value, driven by speculation rather than fundamental demand.

Bubbles are typically followed by a sharp price decline, known as a **burst**, which can lead to economic crises.

### 3.10.1 Leverage and Over-Borrowing:

In a bubble, people and businesses often use debt (leverage) to buy assets, expecting prices to continue rising. For example, during the 2008 housing bubble, individuals borrowed heavily to buy homes, assuming values would keep appreciating.

Easy access to credit amplifies buying power, driving up demand and inflating prices beyond sustainable levels.

Debt allows speculators to amplify their bets. In financial markets, traders borrow money to buy more shares or commodities, increasing the likelihood of inflated prices.

When central banks lower interest rates, borrowing becomes cheaper. This often leads to excessive borrowing and speculative investments, contributing to bubble formation.

If interest rates increase, the cost of servicing debt also rises. Borrowers may default, reducing demand and causing asset prices to drop.

Once borrowers start defaulting on loans, especially in highly leveraged sectors, lenders become cautious. This reduces liquidity, further depressing asset prices.

Falling asset prices lead to more defaults, as borrowers owe more than the current value of their assets (negative equity). This can trigger a cascade of selloffs, deepening the crisis.

**3.10.2 Historical Examples of Debt-Driven Bubbles:**

**The Dot-Com Bubble (1990s-2000)**: Excessive investment in internet-based companies, funded by speculative equity and loans, led to overvaluation. When the bubble burst, stock prices plummeted.

**The Housing Bubble (2000s)**: Widespread use of subprime mortgages (high-risk loans) and financial derivatives tied to real estate led to the 2008 Global Financial Crisis. When borrowers defaulted, the housing market collapsed.

**Tulip Mania (1630s)**: Often cited as one of the first recorded economic bubbles, speculators borrowed money to buy tulip bulbs in the Netherlands, driving prices to astronomical levels before the market collapsed.

**3.10.3 Consequences of Debt-Driven Bubbles:**

**Economic Crises**: The burst of a bubble can led to recessions or depressions. For example, the 2008 financial crisis caused widespread unemployment and global economic downturn.

**Wealth Inequality**: Those with fewer resources often suffer the most during bubble bursts, as they are less able to absorb losses or access bailouts.

**Systemic Risk**: Financial institutions holding large amounts of bad debt may collapse, as seen with Lehman Brothers in 2008, creating ripple effects throughout the economy.

**3.10.4 Policies to Mitigate Debt-Driven Bubbles:**

**Regulation**: Governments and central banks can impose stricter lending standards to prevent over-borrowing.

Financial regulations, such as limits on leverage ratios, help reduce systemic risks.

**Interest Rate Management**: Central banks can adjust interest rates to control borrowing and spending. However, this must be balanced to avoid stifling economic growth.

**Debt-to-Income Ratios**: Capping debt relative to borrowers' income helps ensure that loans are repayable even in adverse conditions.

**Bubble Detection**: Monitoring asset prices and credit growth can help identify potential bubbles early, allowing for preemptive action.

**Speculative Debt**: Debt used for speculative purposes (e.g., buying assets solely for resale at a higher price) increases the risk of bubbles and economic instability.

In capitalist economies, debt serves as a double-edged sword: it can drive growth and innovation, but when mismanaged or used excessively for speculation, it fuels bubbles that can have devastating consequences. Balancing the benefits of debt with its risks is a critical challenge for policymakers and financial institutions.

### 3.11 Tech: A New Bubble or the Start of a New Cycle?

Tech companies have posted exceptional stock market performances in recent years—so much so that some analysts are now questioning whether we're witnessing the formation of a new tech bubble. In this article, we revisit the debate and explore the possibility that we may, in fact, be entering a new technological cycle.

#### 3.11.1 Tech Stocks: A Rally in Three Acts Since 2020:

Since the end of 2019, U.S. tech stocks have soared by 187%, significantly outperforming their non-tech counterparts, which gained just 59% over the same period. However, this outperformance has not been uniform. It unfolded in three distinct phases:

##### 3.11.1.1 The Covid Shock (2020–2021)

In early 2020, equity markets experienced sharp declines as the Covid-19 pandemic began to spread. But tech stocks quickly rebounded and went on to deliver spectacular gains through the end of 2021.

Two major factors drove this performance:

- **Monetary easing by the Federal Reserve**, which favored growth stocks.
- **Acceleration of digital transformation**, as remote work and online services expanded rapidly in response to the pandemic.

##### 3.11.1.2 The Monetary Shock (2022)

Tech stocks peaked at the end of 2021. By early 2022, however, it became increasingly evident that the Federal Reserve would begin aggressively raising interest rates to combat rising inflation. This caused bond yields to surge and growth stocks—especially in the tech sector—to suffer disproportionately. As a result, tech shares posted substantial losses throughout 2022.

##### 3.11.1.3 The Artificial Intelligence Boom (2023–?)

The release of **ChatGPT-3.5** marked a turning point, highlighting the transformative potential of artificial intelligence. This sparked a new wave of large-scale investment in AI technologies across the corporate world.

Fueled by enthusiasm around AI and driven largely by the so-called "**Magnificent Seven**" tech giants, tech stocks began climbing again. The growing expectation of a **Federal Reserve pivot**—a shift from monetary tightening to easing—has further supported this rally since late 2023.

### 3.11.2 Bubble or New Beginning?

The question remains: Are we heading for another tech bubble, or is this the beginning of a long-term technological expansion driven by AI and digital innovation? The answer will likely depend on whether these investments yield tangible productivity gains—and on how well the market distinguishes between hype and sustainable growth.

Figure 16:


*Source: CPRAM, Datastream.*

### Tech Bubble or Not?

Impressive stock performances in the technology sector have reignited concerns about a potential bubble—drawing parallels to the late-1990s dot-com craze. A conventional way to assess market valuation is by comparing price-to-earnings (P/E) ratios, using either trailing-12-month or forward-12-month earnings.

Over a long horizon, the tech sector's P/E typically moved in tandem with non-tech sectors until around 2020. Since then, tech's P/E ratio has climbed significantly faster. Yet, even at today's highs, tech P/Es remain roughly **half** of the peaks seen during the dot-com era.

**Key takeaway:** The extreme optimism of the late 1990s—when many Internet companies traded at stratospheric multiples despite minimal profits and modest earnings growth—does not repeat itself today.

**What's different now?** Today's leading tech firms exhibit **very rapid earnings growth**, which helps justify their higher valuations. Unlike the speculative fervor of the dot-com period, much of today's tech rally is underpinned by robust corporate profits and clear growth trajectories.

In short, while valuations have stretched, the combination of genuine earnings momentum and structural tailwinds (e.g., digital transformation, AI adoption) suggests we may be witnessing the onset of a new tech cycle rather than a pure speculative bubble.

Figure 17:


*Source: CPR AM, Datastream.*

Figure 18:


*Source: CPRAM, Datastream.*

Tech company earnings are indeed on a strong upward trajectory:

1. **Rising Profit Margins**

   Over the past two decades, tech firms have steadily expanded their margin rates—an improvement not matched by the broader U.S. stock market.

2. **Accelerating Earnings Growth**

   Between 2010 and 2017, tech earnings grew roughly in line with the rest of the market. Since the end of 2017, however, tech profits have surged at **two to three times** the pace of non-tech earnings. While the path hasn't been perfectly smooth, the overall trend remains far stronger than for non-tech companies—especially in 2022–2023, when a sluggish U.S. economy weighed more heavily on traditional industries.

Despite this robust performance, memories of the late-1990s dot-com crash still linger, prompting bubble fears whenever tech outperforms:

- **2013–2014:** The Nasdaq's wide lead over the S&P 500 sparked press speculation about a new tech bubble—yet the sector continued to rally thereafter.
- **2018–2019:** Headlines warned of "Tech stocks flashing a warning sign similar to before the dot-com bubble" and asked, "Is a bubble forming in tech?" Despite these concerns, tech underperformance only occurred in **2022**, when the Fed implemented its most aggressive rate hikes since the early 1980s, disproportionately impacting fast-growing growth stocks.

Importantly, the current environment (2024–2025) differs from 2022: major central banks are **shifting back toward rate cuts**, a trend that typically favors high-growth technology companies.

Putting valuation debates aside, the key question is no longer whether we're in a bubble, but whether we are entering a **new, sustainable tech cycle**—driven by genuine earnings momentum and structural tailwinds such as widespread digital transformation and AI adoption.

Figure 19:


*Source: CPRAM, Datastream.*


Figure 20:

**A New Tech Cycle?**

Moore's Law, articulated in 1965, observed that **computing power doubles roughly every two years** as the number of transistors on a chip increases exponentially. This trend has consistently driven down the cost of computation from one decade to the next and has given rise to **distinct technology cycles** every 15 years or so:

- **1960s :** Mainframes
- **1970s :** Mini computers
- **1980s–1990s :** Personal computers
- **2000s–2010s:** Smartphones and mobile computing

Each cycle has seen **semiconductor demand** multiply—often tripling or quadrupling—as businesses and consumers rush to adopt the latest platforms.

Today, we appear to be on the cusp of another major cycle, fueled by powerful **megatrends**:

- **Internet of Things (IoT)**
- **Renewable energy deployments**
- **Electric vehicle adoption**
- **Artificial intelligence (AI)**

These themes all depend on **"silicon"—modern semiconductors**—to process vast quantities of data and run increasingly sophisticated **algorithms** (step-by-step instructions for solving specific problems). As these applications proliferate, **demand for computing power and advanced chips** is once again surging, signaling the potential start of a fresh wave of technological—and market—growth.

Figure 21:


### 3.11.3 Datacenter Innovation and the Dawn of a New Tech Cycle

The rise of **conversational AI**, powered by mature **large language models (LLMs)**, is disrupting traditional datacenter architectures. **Parallel processing** on **graphics processing units (GPUs)** has become the new paradigm, underscoring the need to integrate massive computing power with ultra-low-latency networks and scalable storage—essentially building a "super-brain" for AI workloads. By 2027, the **AI datacenter market** is projected to swell to **$400 billion** (up from $52 billion in 2023). This surge will have cascading effects across the broader tech industry, supplying the critical infrastructure needed to fuel next-generation products, enable deeper customization, and drive substantial productivity gains.

We stand at the **dawn of a 15-year cycle** of innovation and disruption. While the full impact will unfold over time, parallels can be drawn with the post-dot-com era, which gave birth to **social media**, **e-commerce**, and vast new technological ecosystems. Today's emerging technologies—from AI and IoT to renewables and electric vehicles—will likewise redefine industries and shape the next generation of market leaders.

### 3.11.4 Conclusion: Bubble or New Beginning?

Since 2020, **tech stocks** have delivered **spectacular returns**, sparking debate over whether we're in the throes of another bubble. Key observations include :

- **Valuation vs. Earnings:** Tech P/Es have risen sharply but remain about **50% below** dot-com peaks and are supported by **robust earnings growth**.
- **Earnings Momentum:** Tech profits have outpaced non-tech by **2–3× since 2018**, driven by expanding margins and accelerated digital adoption.

- **Interest-Rate Environment:** The aggressive Fed tightening in 2022 led to tech underperformance, but the current pivot toward rate cuts should favor high-growth tech stocks.
- **Insider Activity:** Elevated insider selling has raised eyebrows, a traditional warning sign for bubbles.

**Are we in a bubble?** U.S. benchmarks like the **NYSE FANG+** and **Tesla** shares have soared—Tesla up **700%** since 2020—while European tech indices have lagged. Although valuations have stretched, they are underpinned by genuine structural tailwinds: **AI**, **cloud**, **5G**, and **green technologies**.

Rather than a pure speculative frenzy, the market appears to be pricing in a **new technology cycle** fueled by transformative innovations. The question is no longer simply "Bubble or bust?" but "Can today's tech leaders deliver on the high earnings expectations required to justify these lofty valuations over the next decade?"

Nevertheless, the high returns seen in the United States have led several commentators to suggest that we are now in a technology bubble.

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