To cite this article: Peter Brass(2026). The Nature of Money and Its Systemic Challenges, *Journal of Financial and Economic Dynamics, 1*(3), 156-174; https://doi.org/10.66361/jfed.166

The Nature of Money and Its Systemic Challenges

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Abstract: Economics is a science of perspectives. It requires an understanding of the different interests of buyers and sellers, creditors and debtors, supply and demand, and so on. It is thus a dialectical system in which science seeks synthesis, for example, in the form of equilibrium theories of price formation.

One of the many perspectives is the critique of interest rates. It is an important component of interest rate theory. It addresses the negative aspects of interest rates. However, the discourse is predominantly conducted outside of economics. It is well suited to characterizing the challenges of our existing monetary system and facilitates the description of the processes that lead to deflationary economic crises. It enables the introduction of concepts such as inequality, crises, and limits to growth and improves the possibilities of prediction.

This article examines our monetary system macroeconomically using aggregate values, taking a time and interest rate perspective. The common equilibrium theories are only briefly discussed and classified.

Keywords: money; debt; deflationary crises; interest rate theory; interest rate criticism

1.The nature and creation of money

Money plays an important role in our daily life. It is an accomplishment of the society which renders division of labour feasible and is therewith absolutely essential for modern life.

●It is a mean of payment and makes direct exchange of goods unnecessary.

●It is a medium of exchange, allows the setting of prices and let compare the value of different goods

●It is conditional a store of value and allows to do the exchange later at a more favourable time.

From a materialistic perspective, we depend on the resources available to us through our existence on this earth. From the perspective of the human collective, these resources must get to where they are needed to ensure our survival. From a macroeconomic market perspective, the functions of money described above are our preferred instrument for distributing these resources.

From a particular or microeconomic perspective, it is a negotiation between actors to accept

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money in exchange for goods and services. Anyone who sells goods or services can be confident of being able to exchange the money received for goods or services that meet their own needs or desires. In this perspective, however, money can also be understood as a claim. The provider or seller offers goods or services to society and, through the money earned, receives the right to demand goods or services of comparable value from society. Commodities such as gold or other goods that were traded like money in the early history of money are also considered claims.

1.1 The value of money in this particular or microeconomic view is a claim

For example, describing the value of money as a commodity or as a claim is one of these typical possibilities of different economic perspectives. Different perspectives or different definitions of the economic system, such as the microeconomic or macroeconomic view, lead to different characterizations. While these do not necessarily lead to contradictions, they often lead to different interpretations of events. Taken individually, these perspectives are all correct, but they always only offer part of the reality. This also means, however, that the economic debate would gain in value if the perspective or definition of economic structures were considered more frequently.

Economics is always a question of distribution. Scientific discourse is guided by two opposing tenets that can be summarized with the terms profit and utility.

The rules of profit optimization apply in the capital markets. The goal is to achieve the highest possible profit and acquire as many resources as possible. Profit can be easily represented as a monetary value. This tenet is easy to understand and anchored in our basic instincts. In orthodox economics, this is elevated to a law.

However, if utility is something other than maximum profit, then the goal is to make the best possible use of available resources and to deploy them where they are needed with the least possible effort. This utility is difficult to describe in monetary terms and is anchored as a tenet in our cultural development.

Justice is the central concept. Taking income and labor as an example, it is important to distribute it fairly. The better the work is distributed among many shoulders, the lower the effort for everyone. Optimizing the division of labor would be the economic term for this goal.

Just as economics is a question of distribution, opinions about distribution differ depending on who you ask.

1.2 Money creation

If we consider money as claim, then we can also consider bank notes as a kind of promissory notes. It is not inevitable necessary that the tangible value of these notes must be equal to the numbers which are printed onto these notes. Cashless payments are intangible numbers in the computer network of the bank system. And as most amounts of payment in many countries will be done cashless, we could assert that money is almost intangible.

But we should not deceive ourselves. Money will still be considered as commodity and real asset which is in narrowest woven to reality by the function to be a claim. It crucial influences nearly all decisions of our life at all levels.

If money is narrow, it must be borrowed at the bank. The modern system of banks and central banks are the mean for supply and demand of money which keep savings in circulation and regulate the demand for new money through loans.

Banks can create new money by fractional reserve banking if the need for money is higher than the lendable savings.

Parts of the savings must be kept as reserves while the other parts can be lent out. The lent-out money flows back into the bank system and increases the primary savings. This is a very brief description of an abstract macroeconomic model of money creation. It is something that cannot be recognized as fractional-reserve banking in the continuous and individual transactions between banks and central banks. If the primary reserves were held constant, money supply growth would lead to a finite increase.

The ratio between reserves and savings is the leverage. The higher the legal reserves, the lower the leverage, the smaller the clearance for credits and money creation.

From a microeconomic view or rather view of private sector debts disappear if the last rate is paid. From a macroeconomic view or rather to recognize money as a scheme the process of borrowing and lending keeps money in circulation. It is a process without a beginning or an end. Debts will never disappear. It is an unavoidable part of our monetary system.

But money creation is not a circuit, it is a growing helix(Binswanger, 2013) (Creutz)

From a macroeconomic or aggregate perspective, this means that the borrowed money is not only repaid but also increased through interest repayment, as this also increases loanable reserves. This, too, is an abstract model that is not visible in everyday business transactions.

Due to interest repayment, the demand for money is always higher than available and loanable savings. Orthodox Economists describe this with the theorem that money is always a narrow good. This leads to the so-called helix of monetary growth.

2.monetary time beam and interest criticism

Unwinding the helix of monetary growth leads to the monetary time beam. It is an important model of explanation in the theory of interest criticism.

Money supply grows exponential in an interest based monetary system caused by interest compound. In times of non-crisis most of the capital will be lent out so that the total debts will grow equivalent to the money assets also in an exponential way and as a mirror image.

The debt or liability side is also called the productivity side, since debtors must be productive to repay their debts. This obligation to repay gives money its value. The surplus or backflow of interest seen as

aggregate in the helix of money growth leads to a continually demand for new money and continually increase of money supply.

It also leads to permanent growth in gross domestic product, which can be represented on the asset side of the monetary time axis. Regardless of whether nominal or real GDP is represented, this underscores the different paths of GDP and money supply and shows that there is no direct relationship between these two curves, especially when the majority of an economy's GDP is based on the production of real goods and services rather than financial transactions. But must it show this correlation, if we consider the model of a closed economy? How to link the world of money with the real economy of goods and services is still an enduring contention in economic science. But two aspects are probably confident.

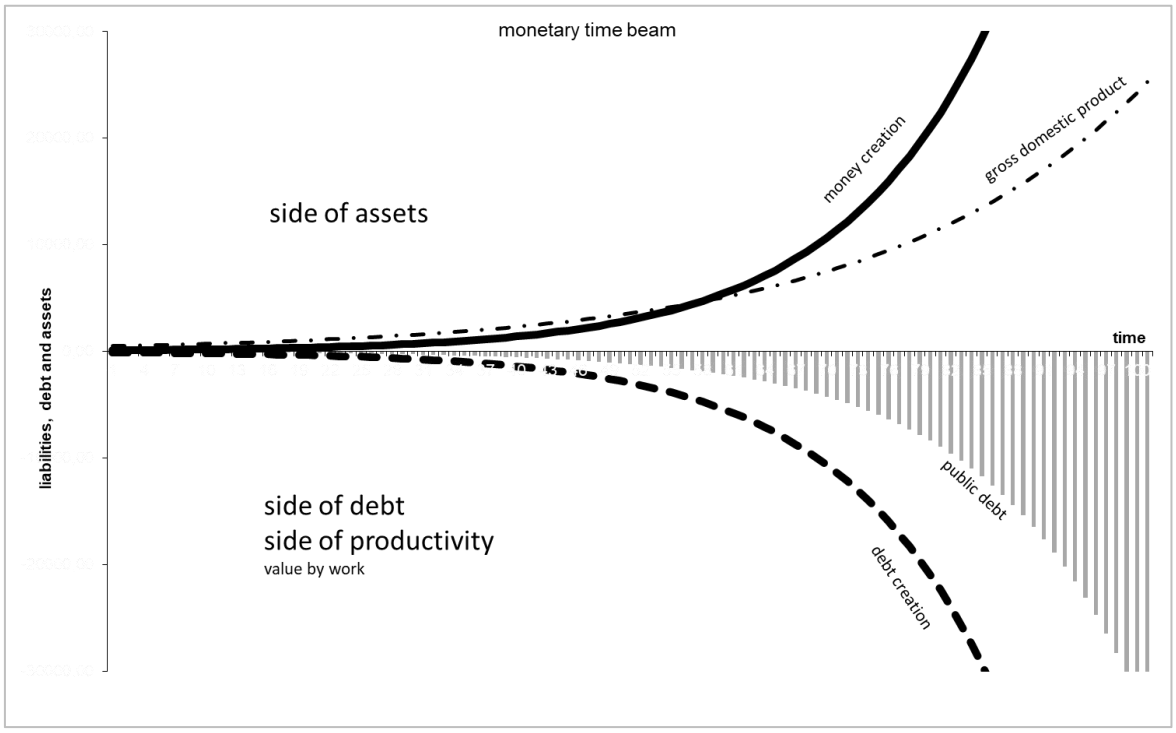


Figure 1: monetary time beam

It is self-evident that money is linked to material goods and services through price. Money serves as a unit of account. Price formation, on the other hand, is well developed in economics as a central object of the equilibrium model.

The second aspect of connecting money with the real economy is that money assets will be backed by receivables and collaterals and the continuous demand of debtors for new money keeps money always narrow which correspond with the economic theorem that money is always a narrow good. It keeps money in circulation and ensures the value of money.

As already mentioned, the economy is a system of perspectives. If the demand is for a sustainable and long-term monetary system rather than for maximum returns on capital, an interest-based system raises several critical problems.

The critical problem is not the exponential growth of the system. If money were neutral, not only money and prices but also income would grow evenly. Purchasing power and wealth distribution would remain constant for everyone. The worst consequence is that rising prices lead to rising numbers, and over time, the decimal point must be shifted in a currency reforms.

The critical problems are caused by compound interest and are described in interest criticism, which lists three main points.

2.1 mass gravity behaviour of interest-based money

Compound interest is the most powerful mean to collect money. It's obvious: the more a creditor lends, the higher the return.

Financial investors will have millions or billions at their disposal. The small saver has significantly less money for savings at likely lower interest rates and, unlike the large saver, is forced to consume some or all their earnings and savings. Typically, the small saver cannot hold on to their savings long enough to become a wealthy owner. Economy is a system of antagonism, means that the investments or savings need the counterpart of debtors. As the savings increase also the debts will increase. Subsequently not only the savings of little savers will not grow also the debts distribute themselves into the society and grow like the big investments. This is an automatic process determined by the mathematical law of compound interest.

Without counter measures leads it inevitably to strong inequality of wealth. European history is a succession of wars, civil wars and revolutions. Investigation of causes for these outbreaks of violence would lead always to causal chains where at the beginning can be found receivables, liabilities, someone who want to have or don’t want to repay something or will be excluded from wealth or even from the means to survive.

It is obvious that a concentration of money capital subsequently leads to an accelerated concentration of productive capital. Business cycles are increasingly shifting from local to global dimensions, and local business cycles are being eliminated. These changes can be clearly observed today. From the perspective of entrepreneurs, the concentration of means of production is being driven by cost reductions through automation. The increase of productivity based on technological progress replaces handwork which leads to an oversupply of manpower. This oversupply brings down the income of workers and makes workers increasingly unnecessary. No one would want to miss technological progress, but social progress cannot follow, as unemployment is a growing phenomenon of modern times and of global proportions. Unemployment or low incomes exclude people from prosperity and can be viewed as a modern form of exploitation that simultaneously accelerates the concentration of wealth.

2.2 Coercion of growth

As already mentioned, the demand for credit or new money, from an aggregate perspective, is always higher than the available and loanable savings. This leads to a never-ending demand for new credit and a never-ending growth of the helix of money. Borrowers must be productive to generate income to repay their debts. This transfers the growth imperative to the real economy. With neutral money, only prices change, not productivity. Productivity remains constant. However, if money is not neutral, productivity must increase.

Rich money owner must spend only a small part of their money for consumption. Parts of the money remain in the speculative space. Speculative space means the trading of proprietary rights with less to no impact onto the demand of tangible goods and services. In former times of the theory of "Freigeld" （Gesell, 1920）（Onken, 1999）（Kennedy, 1995). it was called "hoarding of money". This speculative money is not available for real economic demand and limits the debtors' earning potential. Debtors must increase their efforts to repay their debts. Therefore, the supply of goods and services must be expanded. This corresponds to the experience of companies: they cannot survive without long-term growth. The more money flows into the speculative space, the less money is neutral. The less money is neutral, the more necessary economic growth becomes.

2.3 Coercion of capitalization

Making a profit now is better than in the future, as the money earned generates additional profit in the meantime through interest. This leads to more short-term thinking and action, as we can clearly observe in the behavior of the financial markets. The focus is shifting from the utility of real goods and services to short-term profit. This is significantly influencing economic and political decisions toward more growth to accelerate all types of business and transactions.

From the viewpoint of a peaceful respectively sustainable society is interest a strong burden. From the viewpoint of return on investments they are an inviolable sanctuary. It is almost impossible to call interest into question, because it is taken for granted in almost all societies. On the other hand, it would be a missed opportunity to bypass thoughts on the issue of interest.

If we better understand the system's challenges, we may be able to improve it or at least better predict its negative impacts. Apart from the question of justice, which would go beyond the scope of this essay [1] and for which this monetary system seems completely unsuitable, deflationary crisis are an integral part of the system and that deserves closer examination. Some economists refer to them as market adjustment mechanisms or creative destruction(Schumpeter, 2005).

[1] Justice is a social, not an economic, aspect and therefore not the subject of economics. However, economics is always also the enforcement of society ((Luhmann, 1999)). If economics is about distribution, the distribution of resources can be regulated in different ways, either cumulatively (profit) or distributively (utility). In the spirit of utility orientation, it is important to limit the opportunities to earn money with money – see also(Brass, Profit and Utiltiy, 2017) (Brass, Model of a neutralized currency and exchange system for central banks, 2025).

3. The nature of financial crisis

We can assume that problems can occur on the right end of the monetary time beam as we have seen in the recent financial crisis. The continuous growth will lead inevitably to boundaries. Boundaries in the financial system are reached if debtors can't follow any longer the claims of the creditors.

If we had a self-regulating system that always strives for a balance between supply and demand, the interest rate would tend toward zero when the growth limits were reached. Let's assume the system aims to prevent crises. The overall interest rate in the monetary system would slowly move toward zero and transition into a free-money-like system. However, such a shift in the overall interest rate toward zero is not observed in reality among non-banks!

The goal of financial markets is not to always achieve a balance between supply and demand. It is to achieve maximum return on capital. This is the philosophy of the market, the philosophy of the so-called "homo economicus". These two meanings—balance of supply and demand and maximum return on capital—are not opposites, but they are not complementary either.

Private sector companies that operate exclusively in the financial markets, do not produce goods or services, but trade exclusively in money and intangible assets, ultimately do nothing other than lend and borrow money. Returns arise from the difference between borrowed and repaid capital, but above all from the leverage of fractional reserve banking in cooperation with other banks. Since these companies manage most of the of the world's money, they create new money and debt on a massive scale, thereby accelerating the helix of monetary growth.

Perhaps they do this unconsciously, but a look at the behavior of traders and the recent financial and eurozone debt crisis shows that financial markets are highly creative and constantly seek new ways to create money outside of public control, significantly supported by the capabilities of offshore financial places. Put more abstractly, they are trying to shift the limits to growth and thus increase the pressure on the aggregate debtor side. We have learned that financial markets use their capital to dominate public and political opinion and thus strongly influence social decisions. But the reality of limits cannot be outsmarted.

The monetary economy is only indirectly connected to the real economy through prices and credit. Money markets could theoretically grow indefinitely, while the growth of goods and services is practically limited by available resources. The growth of the money supply is determined by the need for debt and interest repayments, while trade in the real economy is conditioned by the pricing of supply and demand. Over time, a gap develops between GDP growth and the absolute money supply (M3). Since the prices of goods and services do not represent an absolute value, there can be no reliable connection between money demand and the real economy. However, this also means that there is no systemic guarantee that monetary growth cannot cause harm. Central banks and financial regulators must ensure that this does not happen. The philosophy of Homo oeconomicus, to achieve the best possible return, is economically rational and a social consensus. However, it also means that he

constantly tries to shift the limits of growth in his own favor. If we look at all previous deflationary crises, our watchdogs have occasionally failed.

Debtors are under pressure to earn money. The productivity of the debtor side is largely determined by demand and available purchasing power. Although there is more than enough money on the market, it is unevenly distributed. This can lead to a lack of purchasing power and demand in the real economy. This has always been the case for lower-income groups. But it can also apply to higher-income groups. Companies only invest when they can expect demand for their products. Money can become a scarce commodity in the real economy.

To put it another way, in aggregate terms: While there is sufficient money on the market, it is unevenly distributed. It circulates in the speculative space of the financial markets and only finds its way into the real economy for a few transactions. In the long term, this concentration of capital in the speculative space leads to stagnation or a gradual decline in demand. The limit is reached when debtors can no longer meet their creditors' demands. Exceeding this limit means a sharp increase in debtor bankruptcies. Credit flows come to a standstill. As a result, the money supply for the real economy becomes even more scarce, increasing the pressure on debtors. A downward spiral of bankruptcies sets in. The bottom is reached once most bankruptcies have been resolved. A portion of the debtors become impoverished. They are lost to the demand for goods and services, and thus aggregate demand reaches a low point. We call this a crisis.

Gross domestic product decline and money supply comes to a halt because creditors fear losing their investments. This should be visible on the monetary time beam as a movement toward a horizontal line on the side of assets. It could lead to violence if these events threaten the existence of large segments of society. Numerous wars, civil wars, and revolutions throughout world history demonstrate that this happens repeatedly. However, unlike in the past, with modern weapons we are much more capable of bombing ourselves back to a Stone Age civilization. Therefore, it is advisable to maintain our monetary system in a more humane sense.

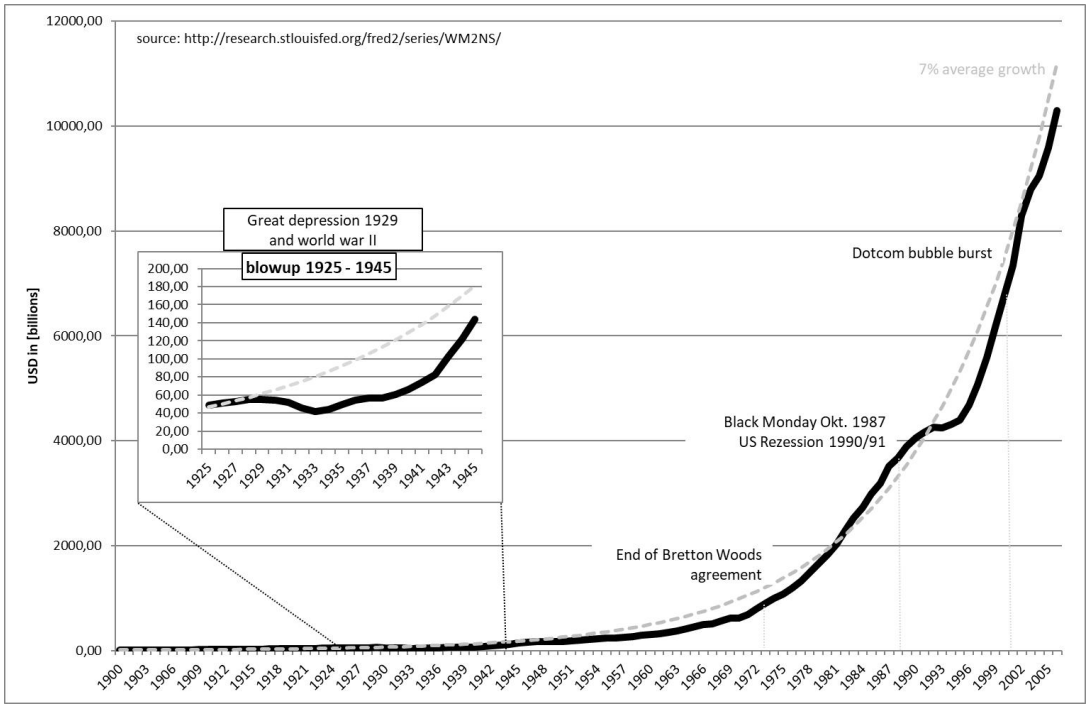


Figure 2: money supply M3 of currency US Dollar from 1900 to 2006 (FRED Economic Data, 2007)

Figure 2 shows the aggregate M3 money supply of the US dollar. The solid line shows the real money supply of the US dollar. The dotted line shows a hypothetical exponential curve with 7% growth per year. It is astonishing how the growth of the US dollar adapts to the exponential curve. This line is interrupted by horizontal steps during times of crisis, such as during the Great Depression of 1929, followed by World War II, the US recession of 1990/91, and the dot-com crisis of 2000. The recording ends in March 2006, so we must switch to the euro.

3.1 The Limits of money supply growth

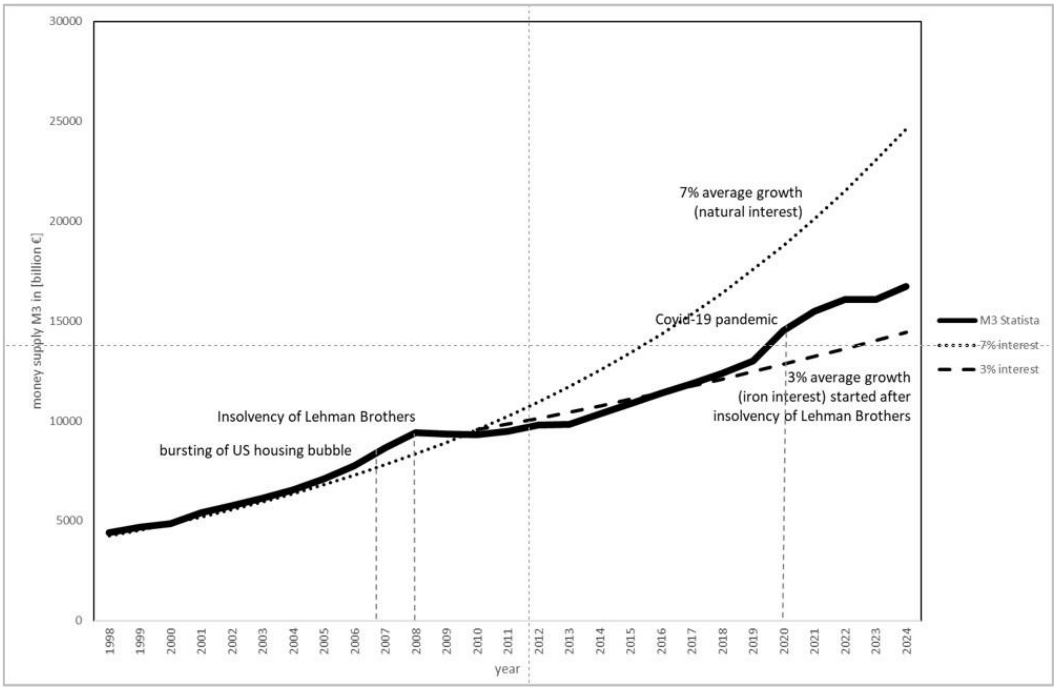


Figure 3: money supply of currency EURO from 1998 to 2024(statista, 2025)

Figure 3 shows the money supply of aggregate M3 of the euro currency. The solid line shows the recorded money supply, while the dotted line represents a hypothetical exponential curve with 7% growth per year. The euro money supply also grew exponentially until the last crisis in 2008, then declined slightly and rose again two years later with lower growth of approximately 3% (dashed line).

3.1.1 Representation of relative vs. absolute money supply growth

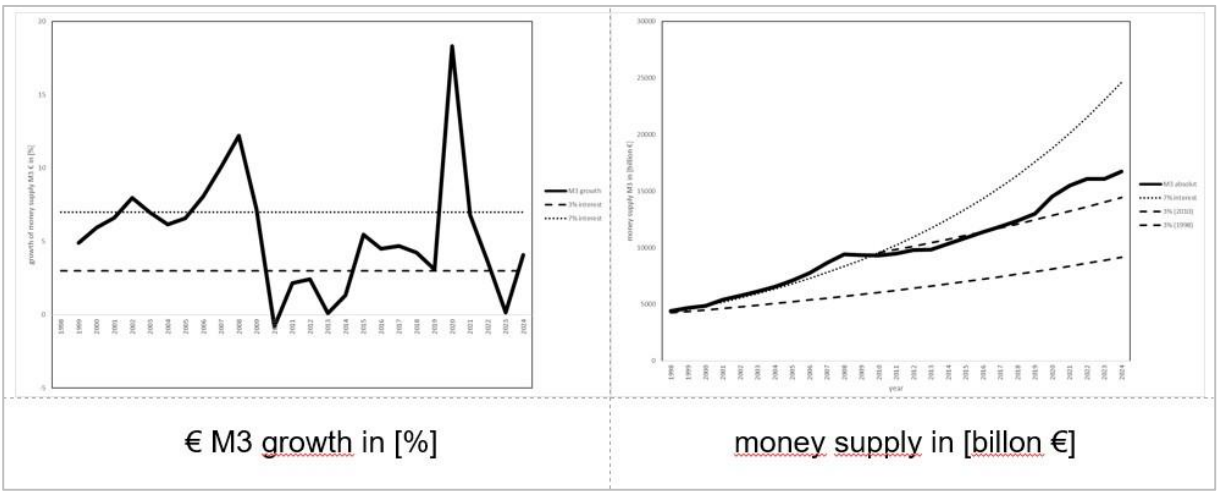


Figure 4: relative vs absolute money supply

There are various ways to represent money supply growth. Relative money supply growth indicates growth in percent. This is the standard representation in economics. It allows for a quick response to changes in money supply growth Interest rates and intervention limits can be simply represented by horizontal lines.

For this essay, however, I prefer absolute money supply growth. It illustrates the geometric growth of the system and corresponds to the asset side of the monetary time beam. This representation is more suitable for describing the system, its macroeconomic interrelationships, and long-term forecasts, and is the preferred representation in interest rate criticism. In this representation, interest rates must be extrapolated using compound interest, and the corresponding starting point must be found (see f. e. 3% interest rate curve in fig 8).

3.1.2 Upper limit of money supply growth

The graphs of the absolute money supply (M3) of the US dollar and the euro show an exponential trend, as expected. In non-crisis times, the curve growth is surprisingly close to 7 percent. This is the average interest rate yield on all credit transactions in a year. It appears to be the maximum return that these developed economies like USA and Western Europe can achieve without risking collapse. In interest rate criticism, this limit is referred to as the natural interest rate(Wicksell, 1898). However, the horizontal steps in these curves confirm that this monetary system is not completely stable and can lead to serious events on the monetary timeline. Deflationary crises are the cause of these steps, because during these crises, money supply growth stagnates.

The principle of profit maximization applies in the financial markets. It is the continuous attempt to push the boundaries of the system toward higher profits and thus also exceed the limits of the natural interest rate. Occasionally, this succeeds, as we saw in the last crisis. The increased borrowing or money creation leads to the debtor side experiencing payment difficulties over time. As soon as this becomes visible, a downward helix begins. The creditor side stops lending to avoid losses. From this point on, the supply of capital becomes scarce. The first debtors, usually companies, file for bankruptcy. Workers are laid off. A portion of the population loses income. Purchasing power declines. Declining purchasing power means declining demand, and declining demand leads to declining prices. Aggregate demand collapses. The increase in bankruptcies leads to an oversupply of assets from the bankruptcy estate. This leads to a decline in asset prices. In anticipation of falling prices, further purchasing reluctance sets in. This increases the deflationary effects. Ultimately, the price decline enables creditors to acquire productive capital cheaply. This typically leads to further capital concentration and profit maximization among a few, but financially powerful, market participants.

The steps in the monetary timeline are easy to explain: In times of uncertain returns, creditors do not lend. However, once they stop lending, they can no longer earn money through interest, and money supply growth must tend toward zero. Contrary to the claim of many orthodox economists, low interest rates do not necessarily lead to higher money demand or an increase in the money supply. This statement does not hold in times of a deflationary crisis, at least not for the M3 money supply.

3.1.3 Lower limit of money supply growth

However, interest-based systems also appear to have a lower limit. Without sufficient government support during and after a crisis, stagnation can occur. We saw this in the eurozone debt crisis following the 2008 financial crisis. Money holders cannot find lucrative investment opportunities. They no longer lend their money. This creates a surplus of unused money, which banks deposit at the central bank by lending it to the central bank. To avoid a subsequent collapse of the monetary system, central banks must sometimes allow negative key interest rates. During the eurozone debt crisis, they were thus able to stabilize the monetary system at a lower level. Had they not done so, money shortages would have occurred again, and the downward helix of bankruptcies and loss of purchasing power would have begun again. Money supply growth stabilizes, but at a lower level. This is a very stable situation, but one with low growth rates and low profit expectations. The higher the profit, the greater the risk, and the lower the risk, the lower the profit. This investment strategy and experience can obviously also be applied to macroeconomic processes. In the euro area, the lower bound for this steady state appears to be around 3% monetary growth. The term "iron interest rate" is sometimes used for this lower bound. The terms "natural interest rate" and "iron interest rate" likely have ideological connotations, so I would prefer to use the terms "interest rate ceiling" and "interest rate floor" here.

3.14. The Control Options of a Central Bank

Central banks must ensure a stable monetary cycle. In an interest-based system, they attempt to keep monetary growth within the range of interest rate ceiling and interest rate floor. Short-term excursions above or below the interest rate bounds are irrelevant. However, in the long term, monetary growth should remain within the range of interest rate ceiling and interest rate floor. The interest rate bounds depend on long-term economic developments and can be different for each currency area, which raises interesting questions. Exceeding the upper bound of the interest rate represents monetary expansion through fractional reserve banking. In this case, the central bank raises the key interest rate.

Exceeding the lower bound of the interest rate represents stagnation of the monetary cycle. In this case, the central bank lowers the key interest rate. In the case of very persistent stagnation, the key interest rate can even become negative. Central banks have learned from the last financial crisis. Perhaps there were too many losses, so the market is currently self-regulating. After all, the last deflationary crisis was 17 years ago. But the system is and remains geared toward profit. Stabilization and control therefore remain a difficult issue.

3.1.5 Hyperinflation

Hyperinflation occurs when money is created on a large scale without credit and growth significantly exceeds what the private sector of the economy can achieve. For example, when central banks directly finance new government debt over an extended period at a rate that significantly exceeds the growth rate of the interest rate ceiling.

4. Debt in general and government debt in particular

Total debts consist of public debts and debts of the private sector. Private sector is distinguished in debts of enterprises and debts of private persons. All money with interest must be lent to get returns. The return must be paid back by the debtors, which have to work for it, described with the idiom “money must work”. Thus, the growth of money supply and the growth of debts are directly connected together. As money supply growths in an exponential shape also the aggregate of total debts must follow inevitable this growth and shape.

In this context public debts have an exceptional position. For centuries, it has been common practice to replace maturing liabilities with new debt. This leads to a visible exponential growth of public debts. In contrast, debt in the private sector is perceived as the creation and disappearance of one’s own debts. This obscures the fact that the aggregate value of private sector debt grows exponentially, like public debt.

The current mainstream discusses paradoxically only public debts. Theoretically, it is possible to separate government debt from total debt in order to reduce public debt. But if the majority wants capital growth, which means profits, parts of the government debt must be overtaken by the private sector, since money supply growth is inextricably linked to debt growth.

In an interest-based monetary system, debt growth is inevitable. We cannot reduce overall debt. The system doesn't allow it. The question is therefore who should take on the debt, the public or the private sector. Dependent from the grade of public evolution, rather for a high sophisticated and democratic controlled administration than for a corrupt administration of undemocratic character, the public sector will try to return all revenues of taxes and indebtedness into public services which support the efforts to keep the social classes in equilibrium of prosperity.

From the perspective of a highly developed public administration, debt within an interest-based monetary system is an important component of public revenue. A reduction of public debts leads to a reduction of public services. Consequently, two options are given: Either parts of public services are foregone, or the private sector must overtake the debt. But for sure, private sector will only overtake in cases of profitability. This can significantly increase the costs of public services and infrastructure. Unprofitable services must be provided through volunteerism and charity, as is common in informal or non-profit economies. For example, non-profit behavior ensures the survival of large segments of the population in severely underdeveloped economies. Underdeveloped economies can also be considered the equivalent of underdeveloped public administrations. Corruption is the application of market economy principles in the public sector by exploiting a state monopoly. In corrupt societies, public services are better substituted in the private sector. There, the thesis is appropriate that the market should regulate itself.

The transfer of public debt to the private sector is privatization. Not only public services, but also infrastructure and land are transferred into private ownership. Financial markets are keen on the profits that can be achieved through this privatization. However, the public should be aware that even when transferred to private ownership structures, the debt must be repaid. This refunding happens through payment of the particular use of now private services. In practice, for example, we are observing sharply rising rents.

One advantage of refinancing public debt through new borrowing on the financial markets is that it represents an investment by money owners in their own returns. The advantage for investors is that they invest their money in safe bonds. They thus benefit directly and indirectly from the advantages of a functioning or improved public infrastructure. In addition to the improved public infrastructure, the advantage for the public is that some of the speculative money temporarily flows back into the real economy. If we assume that large financial assets are taxed little or not at all (a taboo subject in public), then government bonds could be described as the rich man's tax.

It is cost-neutral for the public if the growth of new public debt equals or exceeds the aggregate interest rates on maturing public debt. In contrast, reducing public debt means shifting debt to the private sector, which will ultimately have to be repaid. Only the distribution of payments is different and likely more unfair.

If the growth in new public borrowing corresponds to the aggregate interest rates on maturing government debt, considering monetary growth including the inflation rate, the money supply is neutral,

means it is neutral for the stability of the currency. The growth in new public borrowing corresponds to the growth of the money supply. In a stable economy, the interest rate on new government debt should be aligned with monetary growth. In times of economic overheating, new public borrowing should be below the interest rate for monetary growth. In times of recession, it can or should exceed monetary growth. A temporary increase in new public borrowing above monetary growth does not endanger monetary stability. However, a permanent increase in government debt would inevitably lead to hyperinflation. An expansion of the money supply through government debt is rather unlikely as long as interest rates in the private sector are higher. In booming markets, they always are, so the money preferentially flows into the private sector.

Large economies can borrow in their own currency. This allows them to hedge their currencies, within the limits described, through their own central banks. This offers them somewhat better protection against speculation in the financial markets. They can borrow not only too much, but also too little. In principle, it would be the duty of strong economies, with the help of their government bonds, to stabilize the global economy during a recession through appropriate economic stimulus programs and to mitigate the negative consequences of speculative bubbles. Smaller economies must borrow in foreign currencies. This leaves them with few opportunities for investment or, sooner or later, they fall into a debt trap.

4.1 Debt and Aggregate Demand

Debt growth generally outpaces money supply growth, theoretically up to the leverage of multiple money creation, but in practice limited by the absorption capacity of the productive sector, i.e., along the interest rate corridor. The share of public debt can be determined by the ratio of government debt to the money supply M3. For the Eurozone in 2024, the value is far higher than my initial assumptions:

Government debt / Money supply M3 = % share of the public sector

€13.26 trillion / €16.75 trillion * 100% = 79.16% (excluding foreign currencies)

This is likely due to the fact that a large portion of speculative capital is invested in safe government bonds. This is a hidden pay-as-you-go system (PAYG) with capital returns for the investor. If the debtor side or the producer side is responsible for aggregate demand in the real economy, then the share of total debt is a measure of that share of demand. If this is the case, the influence of government debt on overall economic activity is significantly underestimated.

The ratio of gross domestic product (GDP) to the existing capital in the money supply (M3) is a measure of the effectiveness or velocity of capital. If we assume a constant ratio of government debt to total debt, government debt can be used instead of the money supply (M3).

When government debt is denominated in its own currency, repayment is made through new borrowing. Repayment is therefore independent of GDP. There is no exact value for what the ratio of government debt to GDP should be. Solvency lies primarily in investors' confidence in the state, its bonds, and its currency. As soon as this confidence is lost and investors stop buying the bonds, the

money supply would collapse if the central bank did not intervene. However, investors feel reassured when the ratio of government debt to GDP is low, much like a central bank's gold reserves. They feel even better when GDP is rising. In advanced economies, this is likely only achievable through additional government spending and investment. Therefore, the ratio of government debt to GDP is an ambivalent value.

The ratio of government debt to the money supply M3 reflects the state's ability to adapt to changing economic conditions and global financial markets. The fact that 80% of the debt is public sector suggests that:

Aggregate demand is driven by the public sector, while growth is driven by the private sector.This analysis focuses on the Eurozone. Foreign currency debt was not considered, as it is relatively low in the Eurozone. Other currency areas may need to be considered separately.

4.2 The German debt brake and its effect

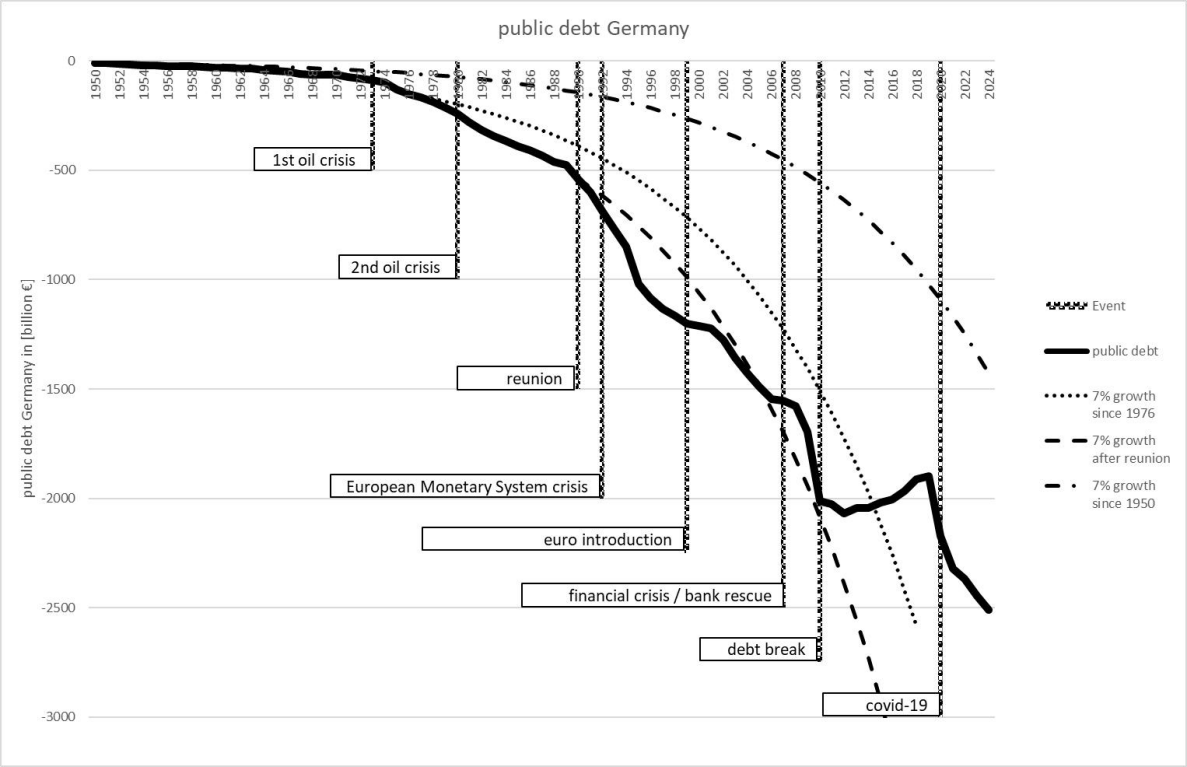


Figure 5: public debts of Germany from 1950 to 2024 (DESTATIS, 2025)

The German words for "debt" and "to be guilty" have very similar meanings. Germany had very bad experiences with the hyperinflation of 1924 and the Great Depression of 1929, although in public perception, a sharp distinction is not made between the two events and their causes. Sometimes this period is viewed as a time of hyperinflation, thus triggering great fear of inflation. Excessive government debt is often cited as the cause of inflation. After World War II, it was common practice for almost all German politicians to promise to reduce national debt. It is therefore unlikely that the German public and government would accept the irresponsible issuance of government bonds. From

this perspective and given the growth of German national debt since the beginning of recorded history in figure 5), all German governments would have failed.

However, if we also consider the dashed line in figure 5), which represents a hypothetical curve with 7% growth and a jump during reunification, and assume that it corresponds to the average monetary growth rate during this period, German government debt correctly grew along the neutral line, where debt and money supply grow at a comparable rate. This means that the cost of debt is neutral, and revenues remain constant.

The German Bundestag has incorporated a law (Article 109, Paragraph 3 of the Basic Law) into the constitution, the so-called debt brake. This essentially represents a commitment to reduce new indebtedness. It is intended to limit structural budget deficits at the federal level and restrict the issuance of government bonds. The rule limits annual structural deficits to 0.35% of GDP(Wikipedia, German balanced budget amendment, 2025). It is questionable whether Germany will fulfil this commitment without causing major problems for the German economy and society.

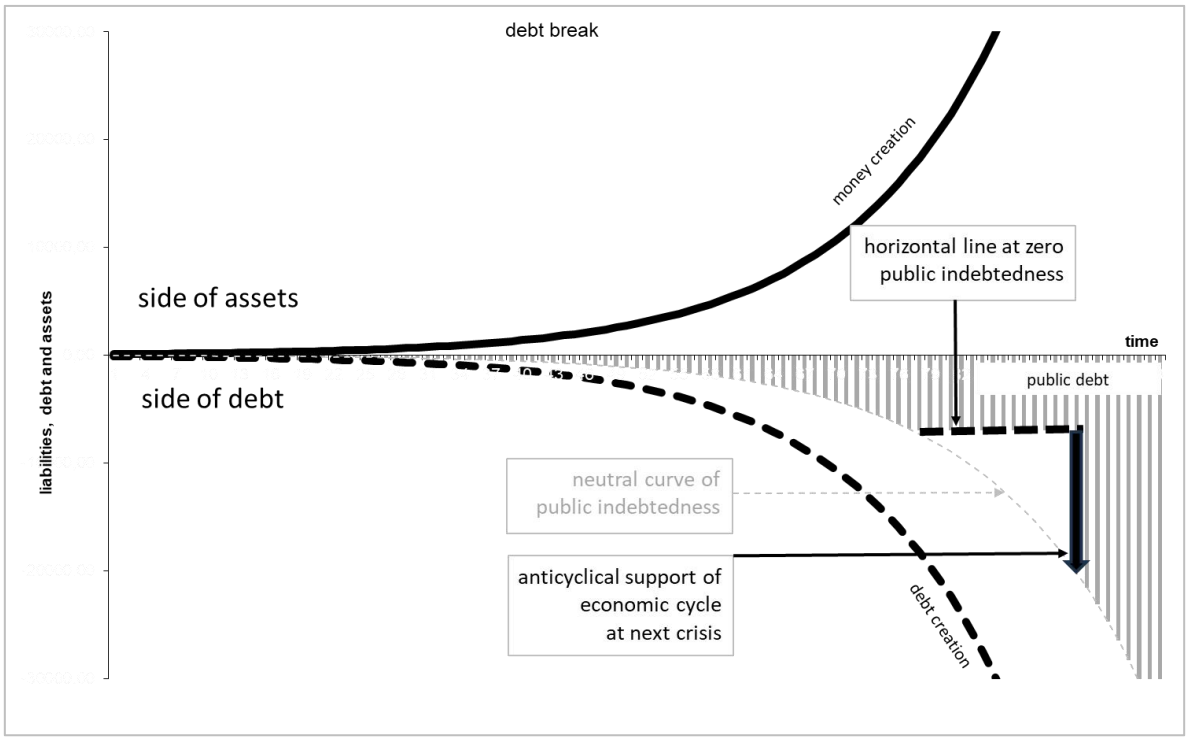


Figure 6: zero new public indebtedness, curve of public debts shift into horizontal line

Figure 6 shows what would happen if the German government were to abandon the neutral debt curve as part of the debt brake. As already described, a gap in the monetary policy schedule would arise on the debt side, which would have to be closed through privatizations. The experience of the last financial crisis suggests that the private sector is unable to maintain the balance of payments between creditors and debtors in the long term. The reason for the decline in private business activity is the decline in money circulation due to declining confidence in the market's solvency. This disrupts the continuity of lending and borrowing, which forms the basis of market solvency.

In the end, the public sector must support the private sector to avoid a chain reaction of bankruptcies. The public sector must replace dwindling private demand and declining interbank transactions. This requires private money, which subsequently leads to new debt. This gives two possibilities: either the public sector can attempt to maintain the neutral debt growth, which would lead to high levels of debt, or it can attempt to avoid new public debt, which would lead to loss of public wealth. But in the end with the same level of public debt.

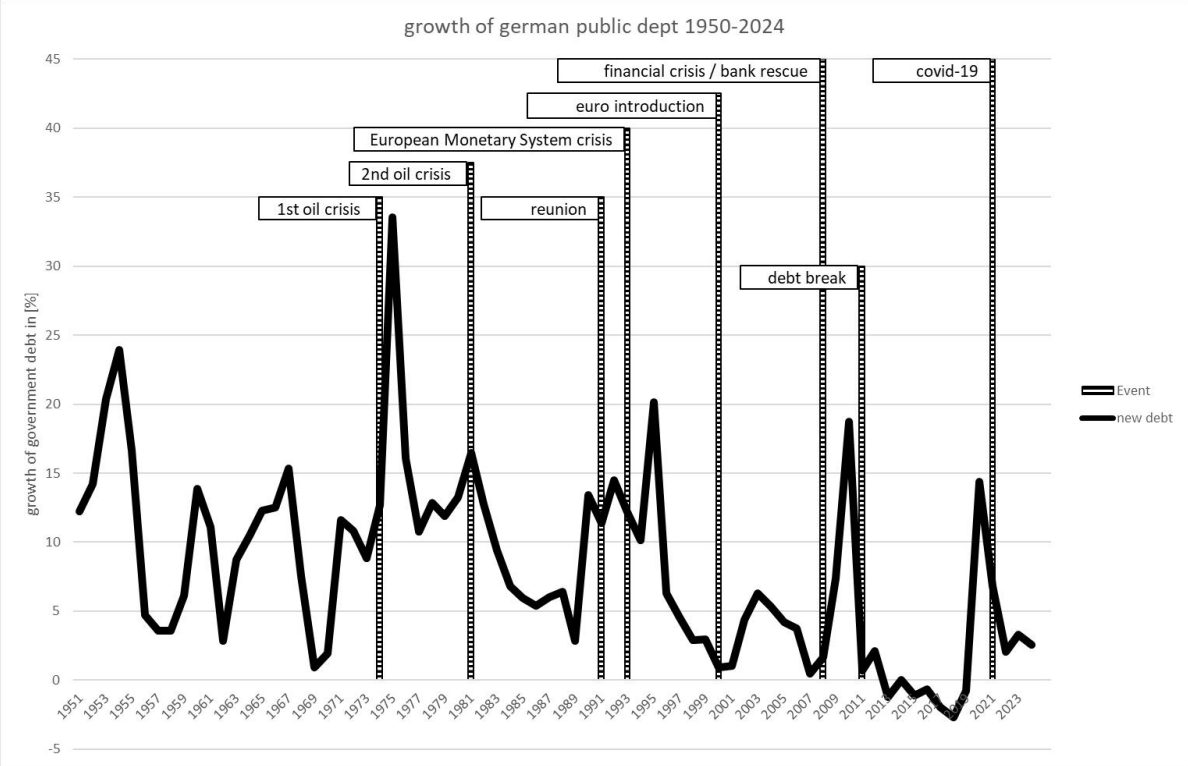


Figure 7: German government debt growth 1950 – 2024(DESTATIS, 2025)

In practice, Germany has always responded to external shocks by supporting the market (see figure 7). However, with the introduction of the debt brake on August 1, 2009, the negative effects of the austerity measures have intensified significantly. Public services are being continually cut; public infrastructure is being pushed to its limits. Social housing is being privatized, rents are rising dramatically. Thousands of highway bridges, schools, etc., need to be renovated, and the railway urgently needs modernization. Continuous maintenance would have been less costly than subsequent repairs to an infrastructure that may no longer be working properly. High rents lead to high social spending by the state, etc.

4.3 Government measures

Countercyclical support through public demand and the provision of money for interbank transactions is the measure used to revive the monetary and credit cycle in stagnation and deflationary crisis. In an environment of deregulated financial markets, it appears to be the only measure capable of stabilizing the system or keeping it stable. If the revival of financial transactions fails, it will lead to the

destruction of parts of the economic and social order. It is generally considered a significant historical event.

5. Summary

We live in exciting times. On the one hand, we have a monetary system that forces us to grow steadily. Due to the compound interest effect, this system is even growing exponentially. The rules of profit apply - privatization of profits and socialization of costs (Kupke, 1985). We are experiencing exploding debt and increasing capital concentration. We see super-rich people like Putin, Musk, and others who want to reshape the future and the social order according to their own ideas.

On the other hand, we have climate change. It shows us the limits of growth(Wikipedia, The Limits of Growth, 2025). If we want to avoid negative experiences, we should adapt our behavior. Survival must be our priority by making the best possible use of available resources and deploying them where they are needed with the least possible effort. Profit and utility are different goals. I wonder if we can adhere to these growth limits with a system designed for growth. I can't answer that question. But we are currently testing it. If the statement is true: The higher the profit, the greater the risk, then perhaps we should consider better solutions. When it comes to money, we need to think about systems in which it's impossible to make money with money. Even if the implementation of such systems seems impossible. The future is open, and without a goal, there is no path.

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