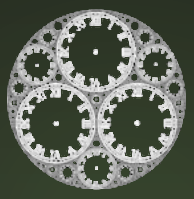

TIME

The Time Financial System

An Introduction To Time As A Currency

Powered by DEVINE GROUP

An Introduction To Time As A Currency

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An Introduction To Time As A Currency

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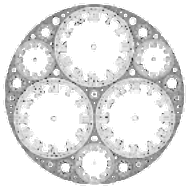


TIME

Abstract

We put forward a peer-to-peer time-based decentralised economic system, where we use time itself as a medium of exchange and reserve currency. This paper showcases the pioneering thoughts and stages that could facilitate a time-based shift of our current ideological opinions on economic theory, proposing the idea of a smart contract system engineered upon Ethereum blockchain infrastructure. Our findings hope to illuminate the implications and advantages of adopting a time-based economic system, including ideological changes towards time as a digital commodity. Our efforts are to improve the efficiency of global financial systems, and sovereignty for all participants involved in this system.

Time definition: the measured or measurable period during which an action, process, or condition exists or continues.

Programmable Financial systems | The Evolution Of Monetary Value

In recent years, the global economy has experienced a significant transformation in the way currencies are understood and valued. Traditional fiat currencies, particularly the US dollar, have been the cornerstone of international trade and economic policy for decades. However, these currencies are not without their challenges (Modern Money Mechanics Federal Reserve Bank Of Chicago). The system design of fiat currencies have many inherent flaws, For instance inflation and endogenous collateral backing, which can erode purchasing power over time. Historical data shows that since the end of the Bretton Woods system in 1971, the US dollar has lost over 80% of its purchasing power due to cumulative inflation.

Additionally, fiat currencies are vulnerable to manipulation through discretionary monetary policies implemented by central banks. This centralization of control introduces risks, such as those seen during the 2008 financial crisis when central banks employed unconventional measures like quantitative easing. While these actions were intended to stabilize economies, they also increased the money supply, contributing to asset bubbles and long-term inflationary pressures.

Geopolitical dynamics further exacerbate these vulnerabilities. For example, sanctions, trade wars, and diplomatic conflicts can undermine the stability and globalization of fiat currencies. The recent shifts in global power dynamics, such as the rise of China and the increasing use of currencies like the yuan in international trade, challenge the dominance of the US dollar and create uncertainties in global currency markets.

In response to these challenges, programmable money has emerged as a transformative innovation in modern economics. (Ethereum: A Next-Generation Smart Contract and Decentralized Application Platform. By Vitalik Buterin (2014)) This concept involves the integration of digital currencies within smart contracts, self-executing agreements that incorporate turing complete (on computable numbers with an application to the entscheidungsproblem. By A.M Turing 1936.) programming logic to automatically enforce the terms of a contract. These smart contracts can define and regulate the rules, conditions, and policies governing an economic system, making financial processes more efficient, transparent, and secure.

Programmable money can automate complex financial transactions, reduce the need for intermediaries, and provide immutable records that enhance transparency and trust. The effectiveness of programmable money, however, hinges on the architecture and engineering of the underlying smart contracts. Flaws in the code or vulnerabilities in a blockchain can lead to significant financial losses, as seen in high-profile cases like the 2016 DAO hack, where an exploit in a smart contract led to the loss of millions of dollars worth of Ethereum.

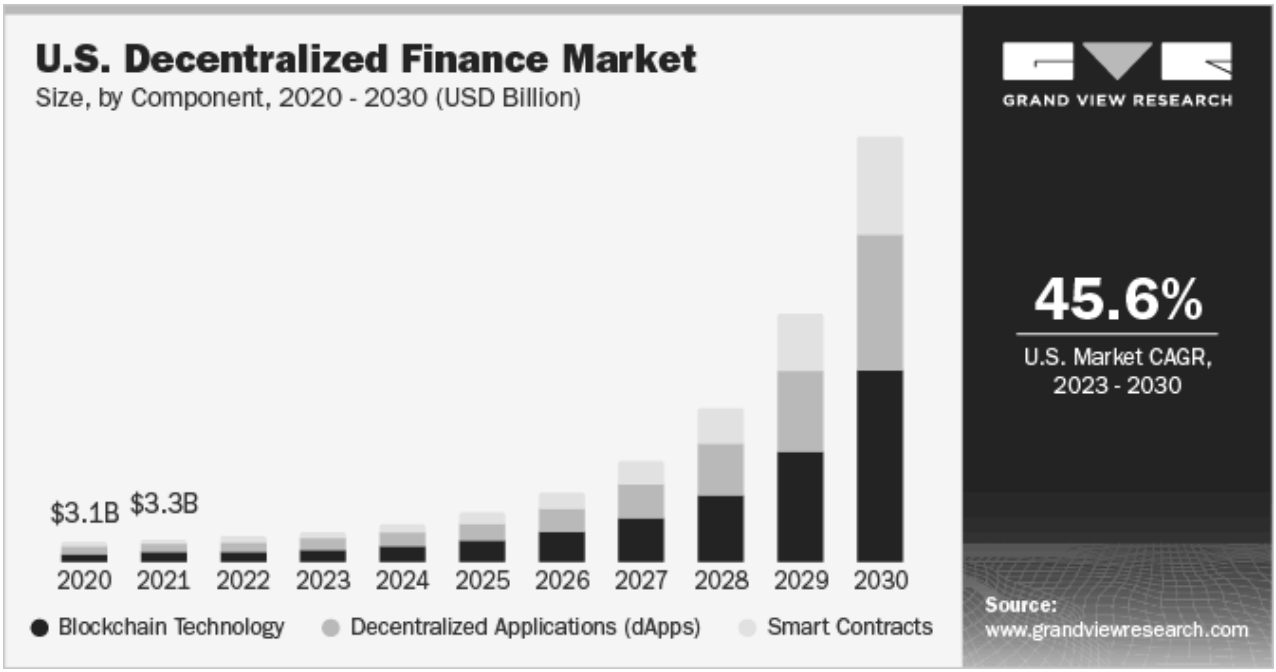
The adoption of programmable money also depends on its ability to address economic challenges more effectively than traditional approaches. When a smart contract is deployed on a public blockchain, its success and adoption rely on whether participants believe it offers superior solutions. For example, decentralized finance (DeFi) platforms have gained traction because they offer alternatives to traditional banking by providing services like lending and borrowing without the need for central authorities.

In parallel, central banks and governing bodies have proposed their versions of programmable money, often referred to as central bank digital currencies (CBDCs). These digital currencies, backed by the full faith and credit of the issuing government, incorporate programmable features that allow for automated enforcement of monetary and fiscal policies.

The Bank for International Settlements (BIS) and several central banks have explored CBDCs as a way to enhance the efficiency of payment systems and maintain governance over the monetary system in the digital age.

However, while programmable money and blockchain technology have shown great potential, they are still in their early stages of development. The field of economics is only beginning to explore the full implications of these technologies. As research and development continues, significant advancements and innovations are expected, which could further reshape the landscape of global finance in the coming years. As with any emerging technology, the long-term impact of programmable money will depend on ongoing experimentation, regulation, and adaptation to the complexities of the global economy.

Projected Growth of the U.S. Decentralized Finance Market (2020-2030)



Bitcoin has pioneered this movement and can objectively be seen as stored electricity, as mining it requires significant computational power, which in turn consumes a large amount of electricity. (Bitcoin: A Peer-to-Peer Electronic Cash System) This concept has inspired the idea of embedding the natural universal constant, time, into an economic system of smart contracts. These smart contracts regulate, conduct algorithmic policies, and issue a digital currency that has an intrinsic backing and store of value based on Unix epoch time as a fundamental economic unit of account.

We will now take a first principles and quantitative approach to analyse economic models used in governing the fiat currency financial system compared to the theorised time smart contract system. Our goal is to quantify clear progressive steps that will lead to the discovery of new economic laws. Let's begin with some basic data to facilitate this analysis.

Taking an objective view of the current federal reserve system in DeFi Related Terms

The U.S. dollar has value because a centralized institution, the Federal Reserve, claims it does. The Board of Governors of the Federal Reserve System consists of seven members who are nominated by the President and confirmed by the Senate. This small group of decision-makers stands in contrast to decentralized autonomous organizations (DAOs), which allow all participants in an economic process to have voting rights in policymaking and other important aspects of running a complex network like a financial system.

The U.S. dollar is not backed by a physical commodity like gold. In DeFi terms, this would be known as endogenous collateral backing, where a protocol's intrinsic assets back other assets within the protocol. This concept contributed to the collapse of Terra Luna, highlighting the risks associated with such systems. The Federal Reserve aims to maintain an average inflation rate of around 2% per year, as measured by the Consumer Price Index (CPI).

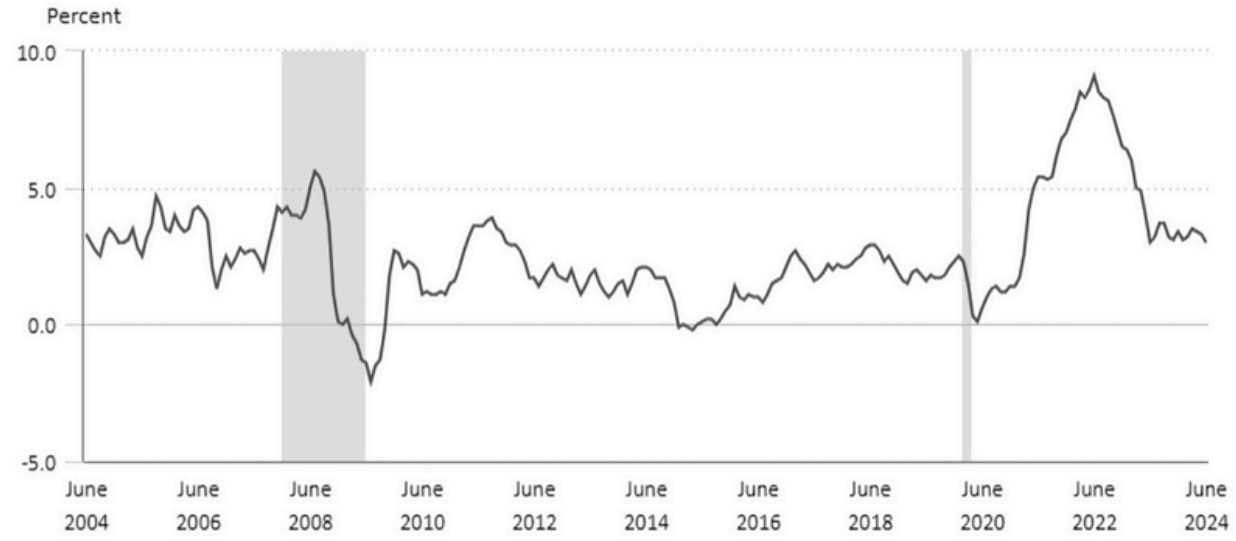
In DeFi terms, think of this as a stablecoin protocol's stability mechanism (The Maker Protocol: MakerDAO's Multi-Collateral Dai (MCD) System 2014), where the target inflation rate (around 2%) serves as a way to maintain a stable value, similar to a stablecoin's collateralization goal. The objective is to keep the value of the U.S. dollar relatively stable, ensuring predictable purchasing power.

When the U.S. government needs money or seeks to maintain economic stability, it doesn't simply print more currency. Instead, it issues debt, which can be seen as the collateral backing the U.S. dollar. This debt takes the form of U.S. Treasury bonds, bills, and notes (collectively known as T-bills).

T-bills, or U.S. Treasury bonds, bills, and notes, are analogous to endogenous collateral in DeFi, regardless of future cash flows that taxes may provide. In decentralized finance, endogenous collateral refers to assets within the same system backing other assets.

Similarly, T-bills support the U.S. dollar's value through government-issued debt, just as a DeFi token's value is backed by assets within its protocol. This approach is similar to the mechanism used by Terra Luna, where its stablecoin was backed by assets within the same ecosystem. However, Terra Luna's collapse highlighted the risks of relying solely on endogenous collateral, as the value of the entire system can become unstable if the internal assets lose value, causing a chain reaction that undermines the currency's stability.

Chart Of CPI, The U.S Dollars DeFi Equivalent Stability Mechanism



Hover over chart to view data.
Note: Shaded area represents recession, as determined by the National Bureau of Economic Research.
Source: U.S. Bureau of Labor Statistics.

As you can infer from the above CPI graph, the US dollar depegs from its 2% target rate undermining it's stability and value.

The Role of U.S. Treasury Bills as a Stability Mechanism for the Fiat System

U.S. Treasury bills (T-bills), along with other Treasury securities like notes and bonds, play a crucial role in maintaining the stability and integrity of the fiat system, particularly the U.S. dollar. These instruments are integral to the financial ecosystem and serve multiple functions that collectively reinforce the stability of the dollar.

Collateral for Monetary Supply

When the U.S. government needs to raise funds, it doesn't simply print more money; instead, it issues Treasury securities. These securities, are sold to investors. The proceeds from these sales provide the government with the necessary funds for its operations and obligations. This approach ensures that the money entering circulation is backed by a 'tangible financial instrument', which in the past, investors have had confidence in.

In DeFi terms, T-bills act similarly to endogenous collateral within a protocol. They back the value of the U.S. dollar by representing a claim on the government's future revenue, primarily through taxes. This creates a stable foundation for the fiat currency, reducing the risk of inflationary pressures that would arise from 'unbacked money printing'.

What is dollar debasement?

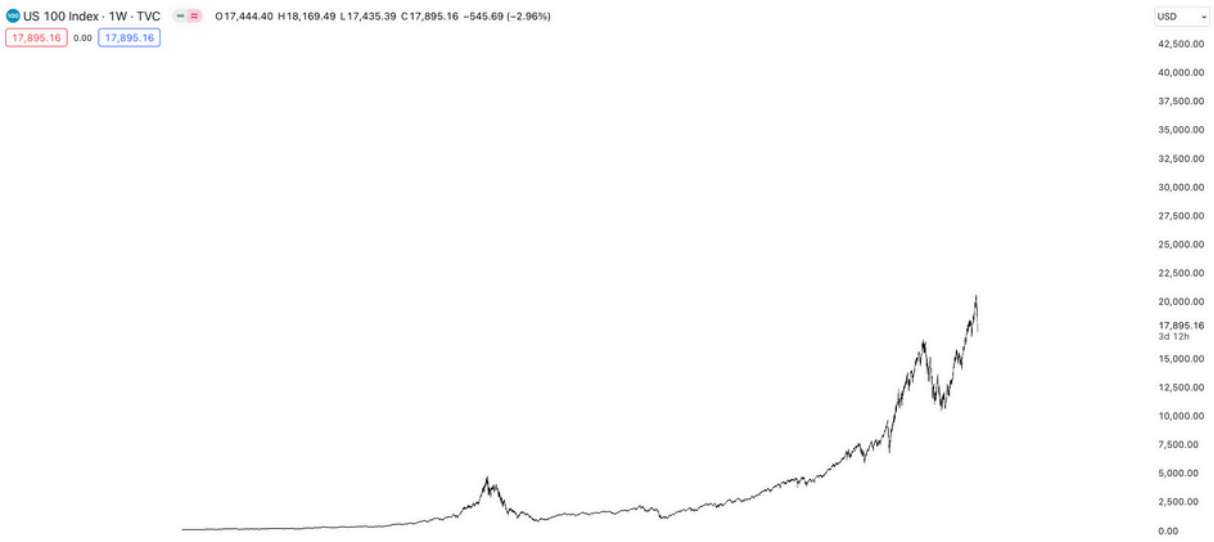
Dollar debasement refers to the decline in the value of the U.S. dollar relative to other currencies and assets, often caused by excessive monetary supply or inflationary policies. This process reduces the purchasing power of the dollar, making goods and services more expensive over time.

As traditional fiat currencies like the dollar lose value, investors and consumers often seek refuge in alternative assets that promise higher returns or more stability. In recent years, much of this value has been channelling into technology sectors, including cryptocurrencies, tech stocks, and innovative start-ups.

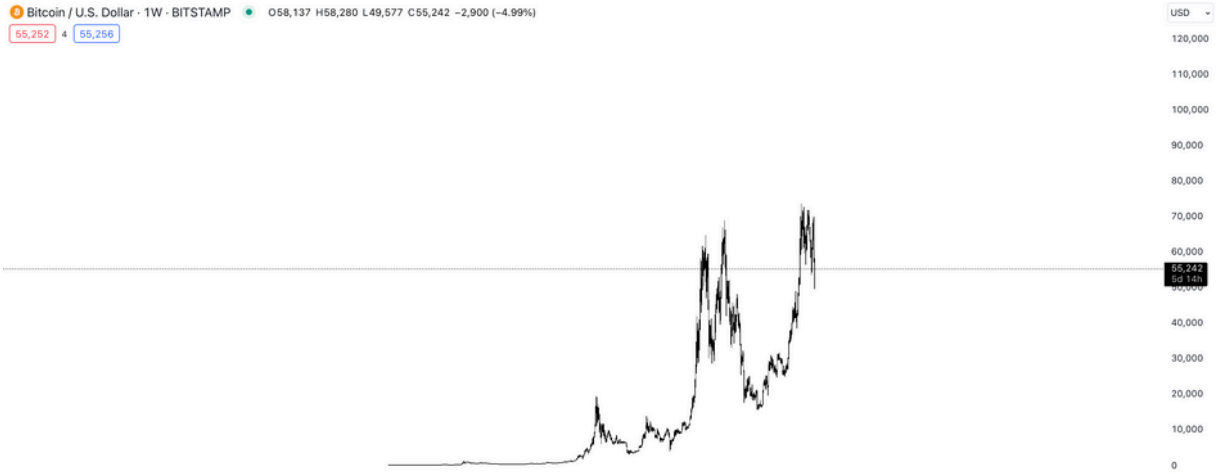
These areas are perceived as high-growth opportunities and offer potential hedges against inflation. The influx of capital into technology signifies a shift in investment strategies, as people look for assets that can outpace the depreciating dollar and provide better long-term value.

The annualised returns of the Nasdaq and cryptocurrency sector is clear evidence of dollar debasement.

NASDAQ/USD



BTC/USD



Have you noticed the elephant in the room yet?

Beyond all of the financial jargon, policies and economic models, what is the value backing the entire fiat financial system?

You could argue that the military is it's backing, yet most of the intellectual property within the defence sector is privately owned. Maybe it's the confidence of the nation or the information asymmetry across participants, we can discuss all day the philosophies behind this intrinsic value but to our understanding thus far. The fiat currency system relies on human perception, often informed by limited knowledge, as its core operational mechanism.

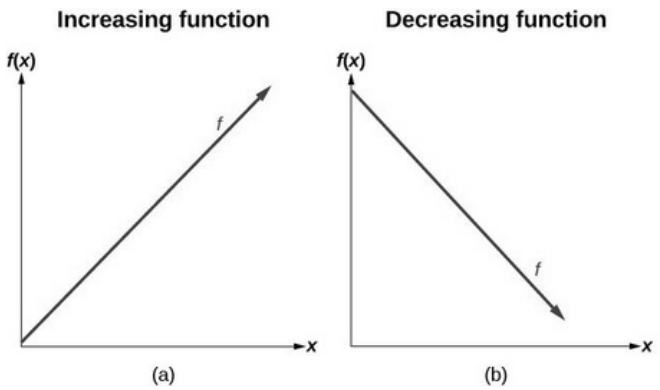
I believe that the U.S. Federal Reserve, the Bank for International Settlements, and central banks around the world have played a crucial role in providing us with a solid solution to an extremely complex problem over the last one hundred years. However, we also believe that all available information is at an equilibrium across all social classes, due to the technological advancement.

And this brings me on to the logic and reasoning behind investing my energy into the time system, we are assuming a long term reform on governance structures and traditional financial systems.

Time can be visualized and engineered as a linear function of value, either decreasing (ticking down) or increasing (ticking forward). This constant, predictable nature gives it a unique property in economics when compared to other forms of value. Unlike other assets, this linear relationship cannot be manipulated. It serves as either an inflationary or deflationary asset, depending on the architecture of the system.

Current unit of account systems like the dollar do not have any functions driving its value, it is based on arbitrary economic models prone to manipulation from a free form design (Keynesian or monetarist theories) with no substance that can be modelled to fit the actor issuing the currency, we see this often within token economics, an imperfect design in the modern era of programmable money.

We do not wish to impose a design that is not modular and decomposable; that is left to the participants. Our role is to build a foundation of the time system and propose and build ideologies that we believe will align with the consensus view.



Why Pursue Such Unconventional Economic ideology?

The Time system is a mission to reform current economic and monetary ideology through new unconventional yet inventive economic application. Unlike central banks and other DeFi primitives that build on auxiliary economic models, we aim to base our approach on natural laws and state-of-the-art advances in science and technology.

After studying Peter Thiel's work, an American entrepreneur, venture capitalist, and political activist. With an estimated net worth of $11.2 billion. A few major points on success have stuck with us and inspired the pursuit of this unconventional economic ideology:

Pursue Unique Ideas: Thiel emphasizes the importance of creating something new and avoiding competition by pursuing unique and groundbreaking ideas.

Long-Term Vision: He advocates for a long-term perspective, focusing on sustainability and lasting impact rather than short-term gains.

Monopolistic Advantage: Thiel argues that successful businesses achieve monopoly-like status by being the best at what they do, thus dominating their markets.

“We live in a world of conformist society and constrained imagination.”

“The most contrarian thing of all is not to oppose the crowd but to think for yourself.”

“If you want to create and capture lasting value, don’t build an undifferentiated commodity business.”

“The single most powerful pattern I have noticed is that successful people find value in unexpected places, and they do this by thinking about business from first principles instead of formulas.”

And then the work of George Soros' theory of reflexivity that wasn't widely accepted for several reasons:

Complexity and Abstract Nature: Reflexivity, which posits that market participants' biases and perceptions can influence market fundamentals, is complex and abstract. It challenges the traditional, more straightforward economic models that assume markets are efficient and self-correcting.

Difficult to Quantify: Reflexivity is challenging to model mathematically and empirically. Traditional economists prefer theories that can be tested and quantified with clear, predictive outcomes, which reflexivity lacks.

Reputation and Perception: Soros is a controversial figure due to his political activism and high-profile financial activities. This controversy can overshadow his academic contributions, leading some to dismiss his theories outright.

Resistance to Change: Academic and professional circles can be resistant to new ideas that disrupt established norms. Reflexivity requires a paradigm shift in how markets and economic behaviors are understood, which can be met with skepticism and resistance.

From synthesizing our academic research of quantitative finance and economics thus far, I can say with relative conviction that financial and economic laws are still very much in discovery and revolutionary ideas have yet to be theorized and manifested into future macroeconomic behaviour.

We predict a general reform of capitalism and monetary systems, as George Soros states, “A lot of the evil in the world is actually not intentional. A lot of people in the financial system did a lot of damage without intending to.”

Learning from past economic models and addressing some of the current inefficiencies within capitalism and utilizing the technological advancement of our financial system, we believe in a world where people will have little to no choice but to obey future economic laws as our systems will consist of near ‘perfect efficiency’ or at least possess orders of magnitude more efficiency than our current solutions.

The goal with Time is not to be a central component of the financial system but to contribute to the evolution of digital commodities and challenge traditional notions of value. Several inherent principles of time itself make it a relevant counterpart in universal commodity exchange, which we will dive deeper into over the next pages.

From other sub-disciplines we can see some form of loss or inefficiency is always present within sciences:

Thermodynamics: In thermodynamics, a system that converts all its input energy into useful work with no waste is said to have 100% thermal efficiency. However, due to the Second Law of Thermodynamics, achieving 100% efficiency is practically impossible in real-world systems.

Information Systems: In information theory, a communication system with no loss of data is described as having perfect information efficiency.

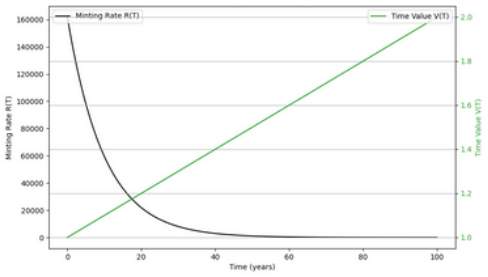
In the conclusion to pursuing such unconventional economic ideology, I believe that the time protocol will at worse provide an the institutional global reserve intrinsically backed asset of time and at best play a big role in the reform of fiat-like inefficient economic systems.

Quantitative relationships between time and the empirical econo-physics evidence.

We will now take a quantitative approach to analyse economic models used in governing the fiat currency financial system compared to the time protocols smart contract system. Our goal is to quantify clear progressive steps that will lead to the discovery of new economic laws. Let's begin with some basic data to facilitate this analysis.

Purchasing power of the dollar

Time as a reserve currency and store of value



Based on inflationary time value and deflationary token design

The concept of linear time is fundamental in many areas of science, philosophy, and everyday life. When we talk about time being "linear," we mean that it progresses in a straight line from the past through to the present and into the future.

The concept of linear time can create the proposition of stored value over time that can be systemized and modelled into a system of smart contracts.

Time is often referred to as the fourth dimension in the context of physics and our understanding of the universe. In classical mechanics, space is viewed as having three dimensions. Length, width, and height where physical objects exist and interact. However, with the advent of Einstein's theory of relativity, time was introduced as an equally essential dimension that intertwines with space to form what is known as spacetime.

In this framework, time is not separate from the spatial dimensions but is intrinsically linked to them, creating a four-dimensional continuum where events occur in both space and time. This concept has revolutionized our understanding of the motions of gravity, and the nature of our universe, as it recognizes time as a measurable, directional flow that impacts all matter and energy in the cosmos.

Science itself has progressed much further than economics and our line of thinking is how can we effectively model these finding within the study of economics to promote efficiency, demand and equilibrium across participants in a social system.

Axioms Of Time:

- Continuity: Time flows uninterrupted and sequentially, with each moment seamlessly following the next.
- Irreversibility: Time moves in one direction—once a moment passes, it cannot be revisited or undone, promoting immutability.
- Relativity: Time is not absolute; it can be experienced differently depending on context, such as speed or environment.
- Interconnection with Space: Time and space are intertwined, forming a unified structure where events happen in both dimensions.
- Scarcity: Time is finite and non-renewable, making it one of the most limited resources available.

Beneficial Economic Properties Of A Time-Backed Digital Currency:

Immutable Nature of Time:

- Constancy: Time is often viewed as a universal constant that progresses in a linear fashion, unaffected by external influences. This constancy provides a reliable mechanism that can be modelled within an economic system through modular engineering of time as a scarce resource relating to how we perceive our time outside of economic theory.
- Immutability: Time flows in one direction, from the past through the present to the future. This unidirectional nature is fundamental to our understanding of cause and effect.
- Interconnection with Space: Time and space are not independent; they are intertwined. Events happen at specific times and places, forming a unified spacetime fabric.
- Scarcity: Time is finite for individuals and systems. There is only so much time available to allocate to different tasks, decisions, or processes.

Universality:

- Global Standard: Time is a universal measure that applies across the entire universe. Unlike other resources or currencies, time is not limited by geography or current economic boundaries.
- Equal Accessibility: Everyone experiences time in the same way, making it a universal constant that is inherently fair and accessible to all. Since time is a constant and universal measure, using it as a resource could promote fairness in transactions and value assignments.

Time as a Resource in an Economic System:

Storing Time:

- Conceptualizing Time Storage: Time could be conceptualized as a resource that individuals or entities can "store" or "reserve" for future use. This involves mechanisms within a digital ledger where time units are quantified, traded and recorded.

Using Time in Transactions:

- Time-Based Value Exchange: Economic transactions could be conducted based on units of time against other assets. For instance, services or goods might be priced in terms of how much time they represent or consume.

Turning Time Into A Quantifiable Asset: Unlike money or other material possessions, time cannot be replaced once it is gone. Every moment that passes is unique and cannot be recovered, making time a finite and invaluable resource. Time is directly tied to economic value even in established economic theory. In professional settings, time is often equated with money through wages, salaries, and productivity. Efficient use of time can lead to greater economic benefits and career advancement, using cutting edge technological solutions we can now quantify this as a digital asset.

Applying These Axioms to Economic Theory:

- Continuity in Markets: Just as time flows without interruption, economic systems should be understood as dynamic, continuous processes. Market conditions, pricing, and supply-demand factors are always in motion. This idea can help build more fluid, real-time economic models that respond to ongoing changes rather than static snapshots, ongoing research will take place regarding time based electronic market infrastructure.

- Irreversibility and Opportunity Cost: The concept of time's irreversibility aligns closely with opportunity cost in economics. Once a decision is made or resources are allocated, the potential for other opportunities is lost. Recognizing this can lead to better decision-making frameworks, encouraging long-term planning and efficient resource allocation.

- Relativity and Economic Perspectives: Time's relativity to speed may allow for advancements in econo-physics in the future to promote nonlinear modelling of time as a value.

- Scarcity and Value Creation: Time's scarcity reinforces its role as a valuable economic asset. In an economy, time is often monetized indirectly—through wages or services—but recognizing time as a core, limited resource could lead to innovations in how we assess value, particularly in the digital economy.

Application to a Digital Reserve Currency:

- We are architecting a digital reserve currency could be designed by taking into account these axioms of time. The currency will reflect the continuous flow of time intrinsically modelled and tied to economic value in real-time electronic markets within decentralized finance.

- The currency will embody the scarcity of time, reflecting its finite nature by being tied to economics, creating a new type of value and innovative economic commodity.

Incorporating the axioms of time into economic theory and a digital reserve currency could fundamentally transform how we view, store, and exchange value, aligning financial systems more closely with efficiency, energetic exchanges and the true dynamics of space and time.

At the core of the Time system is the Time Reserve, a digital unit of account mechanism that represents a quantifiable measure of time. Unlike traditional currencies that are subject to inflationary pressures and external market fluctuations, the time reserve offers stable and universal value directly tied to the immutable passage of time. This intrinsic stability makes them an ideal medium for trading real-time, whether it be for services, experiences, or goods.

The time-based economic system described offers a ground-breaking way to conceptualize and engage with economic transactions. By researching and developing the time financial system we open the door to a more equitable, balanced, and community-focused economy that recognizes time as the ultimate currency. This model not only has the potential to transform individual lives but also to reshape the broader economic landscape, making it more resilient, sustainable, and aligned with human values and needs.

By anchoring the economic value to time, this system introduces a universal measure of value that transcends traditional currency systems. This could lead to a more stable and efficient economic models, as the value of time is inherently less volatile than fiat currencies, which are subject to inflation, governmental policies, and market fluctuations. The time-based economy also fosters a sense of fairness and equity, as time is a universal resource that every individual possesses.

The ongoing research, development, and Time Protocol

The Time Protocol is actively researching and developing V1, aiming to reform current economic and capitalist ideologies through new unconventional economic discoveries. Unlike central banks and DeFi primitives that build on auxiliary models, we aim to base our approach on natural laws and state-of-the-art advances in science and technology.

This is a movement towards econo-physics developments in financial systems, monetary and economic theory.

“We live in a world of conformist society and constrained imagination.” - Peter Thiel

This paper constitutes an introductory remark surrounding the ongoing research and development of the Time Protocol.

The transition to a time-based economy holds the promise of a more stable and efficient system. By issuing and anchoring the value of currency to time, the Time Protocol manifests a way to innovate and mitigate the risks associated with fiat currencies as we research and engineer an economic system that promotes stability and efficiency through programmable money and a unit of account system of time.

This paper serves as an introduction to the concept of time as a currency, providing foundational insights rather than comprehensive empirical analyses, logical frameworks, or detailed system designs. Future publications will delve into the system's architecture and present quantitative models for effectively issuing this system to the public.

Current related developments nearing completion:

The Time Reserve Whitepaper and Smart Contract System (Daniel Campbell, Devine Group)

Algorithmic Policy Making and decomposable social ideologies (Daniel Campbell, Devine Group)

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