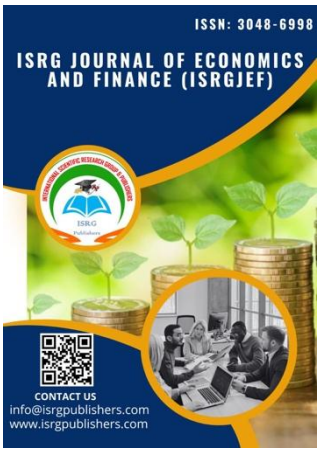
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Space Currency System: An Exploration of Its Feasibility

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Abstract

This research paper explores the historical evolution of currency and the prospective feasibility of a universal (cosmic) monetary system enabled by advancing space exploration technologies. Beginning with the transition from barter and commodity money (shells, gold, silver, and copper) to paper banknotes during China's Southern Song Dynasty, it examines how long-distance trade, particularly along the Silk Road, necessitated lighter, more portable instruments of exchange to reduce transportation costs. These early banknotes, issued by major banking houses and redeemable for precious metals, paralleled modern arrangements such as the note-issuing privileges of banks in Hong Kong. The discussion then turns to the role of international recognition in determining a currency's value and stability. Looking forward, this paper argues that rapid progress in rocket technology and interstellar travel is rendering space accessible, thereby creating the conditions for a multi-planetary monetary architecture. We proposed space currencies, including Moon coins, Mars coins, and Earth coins, would be backed by regionally abundant natural resources (helium-3 on the Moon; water, combustible ice on Mars; terrestrial resources on Earth). Currency value would be shaped by trade volume, energy demand, transaction volume and transaction costs. Overall, the emergence of such resource-backed space currencies is presented as a natural extension of historical monetary innovation, offering a framework for economic coordination in an era of potential space colonization and contributing a forward-looking perspective on the future of money.

Keywords: universal monetary system; cosmic currency; space currency; Moon coin; Mars coin; Earth coin; resource-backed currency; helium-3; lunar resources; Martian water; combustible ice; interstellar travel; space exploration; space colonization; currency evolution; banknotes; Southern Song Dynasty; Silk Road; international currency recognition; transaction costs; trade volume; energy demand; monetary innovation; future of money.

Introduction

Regarding traditional currency, the Southern Song Dynasty played an important role in developing the use of paper money. In earlier periods, exchange often took the form of barter, while shells, gold, silver, and copper coins were later used as means of payment and units of settlement. As trade expanded particularly over long distances along routes connected with the Silk Road, merchants needed to transport increasingly large quantities of metal currency. Carrying large amounts of gold, silver, or copper coins was

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inconvenient and expensive because of their weight and the costs of transportation. To address this problem, merchants began using paper certificates that represented deposits of metal currency. These certificates could be exchanged for coins, silver, or gold at designated offices. Over time, such certificates developed into a widely accepted form of paper money. The earliest paper notes, were initially issued by merchant groups in Sichuan during the Song Dynasty. They functioned as promissory notes or exchange certificates and were later recognised by the local government. In 1023, the Song government established a Paper Notes Office and took control of their issuance. During the Southern Song Dynasty, the government promoted the use of paper currency, especially the *huizi*. These notes circulated alongside copper coins and silver, and were used for daily transactions, tax payments, and larger commercial exchanges. The system was in some ways similar to modern Hong Kong, where commercial banks such as the Bank of China, HSBC, and Standard Chartered issue banknotes. However, in the Southern Song, paper money was mainly issued or regulated by government institutions rather than by private commercial banks. Holders could exchange the notes for metal currency at authorised exchange offices, although the value of paper money could decline when too many notes were issued.

Discussion

From 1000 to 2000, particularly after the Industrial Revolution, currency increasingly circulated beyond national borders. As international trade and finance expanded, some currencies began to circulate across borders and were used in cross-border transactions.

However, a banknote could be used internationally only if it was recognised and accepted by foreign merchants, banks, and governments. If a currency lacked international recognition, it would generally circulate only within its issuing country and could not easily be used abroad. In short, the more widely a currency is recognised and trusted, the higher its relative value and usefulness in international trade. Conversely, if confidence in a currency is undermined, for example, by inflation, political instability, or weak monetary policy, its international recognition and value may also decline. A currency's international role depends on its acceptance as a medium of exchange, unit of account, and store of value.

The feasibility of the cosmic monetary system

Today, space navigation and travel are becoming increasingly feasible. Advances in technology, particularly rocket technology, have made travel beyond Earth more achievable than it once seemed. As humans gain greater access to the Moon, Mars, and other parts of the Solar System, new forms of currency may emerge to support space-based economic activity. As the universe becomes accessible, a cosmic currency may emerge. In the future, there could be currencies on the Moon and elsewhere in the universe. Any currency needs a "anchor spear," and cosmic currencies are no exception.

In the future, there could be currencies used on the Moon, Mars, and other celestial bodies. Like any currency, a cosmic currency would need a reliable form of backing. For example, a lunar currency could be backed by valuable natural resources found on the Moon. Helium-3 is one of the Moon's most important potential resources. It is deposited in lunar soil by the solar wind and could potentially be used as fuel for nuclear fusion.

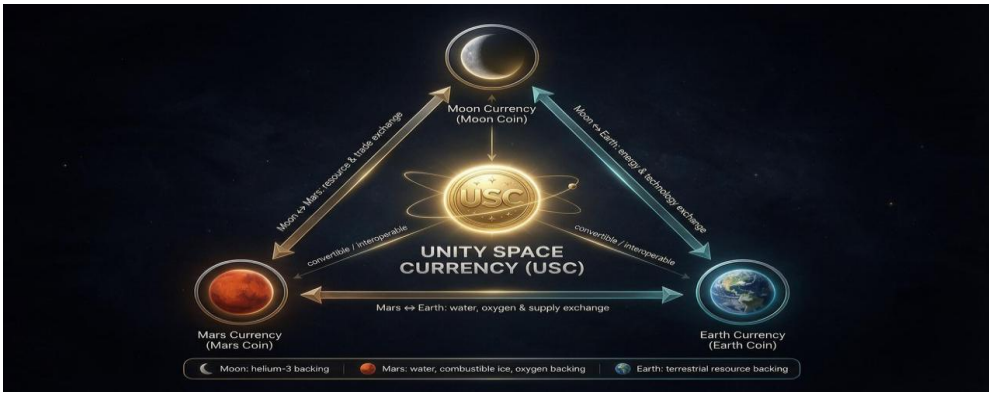
NASA estimates that the upper few metres of the lunar surface may contain at least one million tonnes of helium-3, making it a possible long-term energy resource. Mars may also possess valuable resources that could support a future currency system. It has substantial deposits of water ice, including ice beneath the surface and in polar regions. Water can be used to produce oxygen and hydrogen, which may support life support systems, fuel production, and rocket propulsion.

Similarly, a currency system on Earth could be backed by recognised natural resources, such as gold, silver, energy resources, or other commodities with stable economic value. The key principle is that a currency needs a credible source of value and trust in order to function effectively. A "Space Currency System" on Moon, Mars and Earth could likewise use some of the natural resources as backing.

As space technology advances, activities that once seemed beyond human reach are becoming increasingly feasible. If space travel, resource extraction, and settlement continue to develop, a space-based currency system may become a realistic possibility in the foreseeable future. Space currencies would not be merely symbolic. As economic activity expands beyond Earth, people would need reliable instruments to settle trade, pay for services, store value, and conduct transactions. These recognised trading instruments would need to be backed by credible assets, such as regional natural resources. Over time, different currencies could emerge for different locations, for example, lunar coins, Martian coins, and Earth-based currencies. Together, these currencies could form part of a broader cosmic currency system.

The value of such currencies would depend on several factors. First, they could be backed by natural resources with economic value, such as lunar helium-3, water ice, metals, or energy resources. Second, their value would be influenced by trade demand, energy demand, transaction costs, scarcity, and confidence in the institutions that issue and manage them. A currency becomes valuable not simply because it exists, but because people trust it and can use it to exchange goods, services, and resources.

Novel Suggestion



Novel Model 1: Space Currency Concept

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First, the Moon currency should be backed by the Moon's own resources, including minerals, water ice, helium-3, and other locally produced assets. This would give the currency a tangible foundation rooted in lunar economic activity rather than depending entirely on Earth-based financial systems. Likewise, the Mars currency should be backed by Martian resources, such as locally extracted materials, energy production, industrial capacity, and other forms of value generated within the Martian economy. By tying each planetary currency to the productive capacity of its own environment, the system could better reflect the real economic value created on the Moon and Mars.

Second, the Earth currency should be established as a supranational single currency, jointly governed and supported by the collective resources, productive capacity, and financial strength of participating nations. The concept of a supranational world single currency has been proposed by C.P Lie (2004) "PongCoin" and the IMF's Special Drawing Rights, both intended to reduce reliance on a single national currency and support international stability. In this framework, the Earth currency would function as the common unit for terrestrial trade, investment, and cross-border settlement, while remaining distinct from the currencies used on the Moon and Mars.

Finally, we propose initially creating the Moon currency, Mars currency, and Earth currency as separate but interoperable monetary systems. Each currency would be designed around the resources, institutions, and economic conditions of its respective celestial body. As trade, infrastructure, and financial networks among Earth, the Moon, and Mars develop, these three currencies could gradually be integrated into a single "Space Currency." Such a currency would support interplanetary commerce, reduce exchange-rate complexity, and provide a common unit of account for the emerging space economy. Successful implementation would require international coordination, credible governance, transparent issuance rules, and reliable methods for valuing and auditing the assets backing each currency.

Additionally, a coherent multi-planetary monetary architecture should proceed in carefully sequenced stages.

1. Resource-backed lunar currency

The "Moon Currency" must be fully backed by verifiable lunar resources, primarily helium-3, rare-earth elements, water ice, and other extractable materials whose quantity, accessibility, and economic value can be independently audited. This resource backing establishes intrinsic credibility and anchors the currency against purely speculative issuance.

2. Resource-backed Martian currency

Likewise, the "Mars Currency" should be collateralized by Martian resources of demonstrated or projected economic significance (water, minerals, construction materials, potential agricultural output, and energy resources). Parallel resource standards for the Moon and Mars create transparent, comparable foundations while allowing each body to retain monetary sovereignty during the early phases of settlement.

3. Earth's supranational world single currency as the terrestrial anchor

On Earth, the existing patchwork of national currencies should converge into a single supranational unit (building on or evolving from present frameworks such as the IMF's Special Drawing Rights or a more fully realized global unit of account). This terrestrial currency would serve as the primary settlement medium for Earth, space trade and as the reference standard against which lunar and Martian currencies are initially valued.

4. Initialization and phased integration into a unified space currency

Once the three currencies are operational, Moon currency, Mars currency, and the terrestrial supranational unit, they can be deliberately integrated. Integration would begin with fixed or tightly managed exchange-rate bands, progress through a common unit of account for interplanetary contracts, and ultimately culminate in a single "Space Currency." This final unit would be backed by a diversified basket of lunar, Martian, and terrestrial resources and productive capacity, thereby creating a monetary system capable of supporting commerce, investment, and settlement across the Earth–Moon–Mars economic zone.

This sequence prioritizes credibility through resource backing, preserves jurisdictional autonomy during the developmental phase, and only later consolidates the three currencies into one resilient, multi-planetary medium of exchange.

Conclusion

In summary, this article suggests that currency systems may evolve as human activity expands beyond Earth. A future cosmic currency system could include Moon coins, Martian coins, and Earth-based currencies, supporting trade and economic activity in space. As space exploration and settlement become more feasible, these currencies would require credible backing, effective institutions, and public trust. We hope this research provides a new perspective on the future of currency and contributes to humanity's long-term development in space. Thank you.

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