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# Competing Virtual Monies

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## Abstract

Money as a generally accepted media of payment has been running through various evolutionary stages, the latest being virtual money. Virtual money is a money-like electronic payment system for business transactions on the Web. Different companies supply different virtual monies. If we regard the Internet as a new, relatively separate nation, and a nation usually has just one currency, the main question is whether virtual money should be supplied by monopoly or through competition? This article shows that on one hand competition provides special advantages but on the other hand the monopolistic supply of money offers advantages as well. The same is true for disadvantages. It is shown that competition is no guarantee for an optimal solution, but the opportunity of choice and flexibility as offered in competitive systems provides a better base for a prospering (virtual) monetary system than any monopoly-like situation.

## Money

As this paper focuses on the primary function of money - the exchange function (Issing, 1993) - money is defined as a generally accepted medium of payment (Jackson 1986). But money has not always been the same. There have been three major steps in the evolution of money:

1. coins made of metal,
2. paper money,
3. immaterial money.

Earlier forms have not been replaced by younger forms, so paper money is not a substitute for coins, and immaterial money will surely not replace paper money. All three types exist side by side as complements, not as substitutes (Harlandt, 1989).

## Virtual Money

It is not the purpose of this paper to describe the technical details of virtual money transfers. From an economic point of view these are secondary aspects of electronic payment. Nevertheless I will explain how virtual money works in general.

Virtual money is a 'mint based' electronic payment system and provides analogously to real money anonymity in cyber space. (Merz, 1996; Bachem et al., 1996). At present, both buyer and seller must have deposits at the issuing bank. At first the buyer has to instruct the bank to transfer money from his real world account to his account's virtual money mint. Funds in the mint are no longer bank deposits. Buyers can withdraw funds from the mint at any time. The funds can be transferred to the hard disk drive of the buyer's personal computer. The funds in the mint and on the buyer's hard disk can be regarded as electronic wallets. For cash settlements, the buyer simply encrypts the amount of virtual money needed and sends it to the seller. After receiving the cyber cash, the seller can use them for further transactions in electronic commerce or transform them into real money (Panurach, 1996; Schwickert, 1996; Spranz, 1996).

## A brief theory of competing virtual monies

The most important question related to this topic is: Who should issue virtual money? Hayek mentioned that even in the economic literature there is no explanation "*why a government monopoly of the provision of money is universally regarded as indispensable, or whether the belief is simply derived from the*

*unexplained postulate that there must be within any given territory one single kind of money in circulation." (Hayek, 1976, p. 21)*

But the idea of competing monies is not a purely theoretical idea of economists. There is empirical evidence that such systems existed in the real world. China, for example, from 1948-50 had five different monies circulating, i.e. the U.S. Dollar, two different kinds of Silver Dollars, small gold bars and the national paper money. Another example is given by Korea in the period of 1952-53 when three monies were circulating: the Korean Currency, U.S. Dollars and Military Payment Certificates. Before paper money was introduced we usually find - everywhere in the world - competition between coins made of different metals (usually gold, silver and copper). So it is obviously true that the initial development of money must have happened in a competitive situation (Tullock, 1957).

In addition to these extremely unique situations stated above we can easily imagine a more 'normal' example of a situation where more than one money is in circulation. As money is a medium of payment, basically anything can be used as money. Assume a gas station distributes coupons (a \$10 value) through the mail weekly, hoping that this campaign brings new customers and that regular customers and new customers will buy an amount of gasoline that is worth more than \$10 (coupon value). If now all other gas stations in the neighbourhood declare that they will accept these coupons as well, these coupons will become something like money. If we go one step further and assume that people accept these gas coupons in trade for other goods, services or coupons (e.g. car-wash coupons), then these coupons are serving as an additional kind of money (Lynch and Lundquist 1996).

But in spite of these facts very few areas of economic activity can claim an equivalent long era of agreement on the usefulness of government intervention as the supply of money. (Klein, 1974) This general acceptance is nevertheless amazing because it has the same deficiencies as all other monopolies (Hayek, 1976):

1. people must use the monopoly's product whether it is unsatisfactory or not;
2. the development of better methods of satisfying human wants and needs is usually absent without competitive conditions

In addition to these facts, there is one typical monetary deficiency of an issuing monopoly: The issuer is able to declare that his money has a certain value not depending on the real value of the money. (Schöpf, 1993) Under conditions of competing monies such a situation can not occur (Tullock, 1975). If one of the monies claims to be more valuable than it actually is, people will not use it. Therefore the issuing companies would be forced to make emissions according to the real value of the money. (Hayek, 1976)

The advantage of competition is that none of the money suppliers would issue money that is less reliable (value stability) and useful (technical quality) than the competitors (Hayek, 1976). But different monies and competition also have disadvantages, for example high transaction costs. It seems only logical that just a single money is able to minimise the transaction costs occurring through exchange and evaluation. Assume that there is a system with two competing monies, called A and B and one of them, A has wide acceptability and therefore low transaction costs and is issued by the government. The less widely used money, issued by a private supplier, would have larger transaction costs. If nothing changes there is no stimulus to use money B. But if the value of A declines for some reason - e.g. because the government is engaging in inflation - the individuals may lose trust in money A. Under these circumstances there will be a stimulus to use money B. But if more people use money B, its acceptance will grow. This could be an encouragement for money A customers to switch to money B. If the demand for one money increases its value increases too and the transaction costs will decrease because with greater acceptance (rising demand) it is much easier to convert it into goods, assets or other monies (Tullock, 1975). So under certain circumstances positive feedback may lead to the situation that the former weaker money becomes the stronger one.

**To them that hath shall be given**

Virtual money is a good - based on certain technologies. Standard neoclassical theory tells us that if we have different competing goods - according to the rules of perfect competition - the best of them will prevail. Unfortunately perfect competition does not exist in the real world. Therefore something different could happen. But what and how? The answer gives us the theory of increasing returns and positive feedback by Brian Arthur. Arthur's original article investigates a situation where different agents choose between technologies competing for adoption.

Before going into theory, we can look on two empirical examples: The first is the standard QWERTY for keyboard layouts. At the beginning of the production of typewriters QWERTY was not a standard, but when the Remington Sewing Machine Company started a mass production using QWERTY it became a standard. The reason was that lots of typists started to learn the QWERTY system because there were lots of typewriters using this system (mass production) and because of the fact that many people were familiar with the system many people bought it (Waldrop, 1992). The second example is the Beta versus VHS competition. VHS was able to corner the market but only because VHS were lucky enough to achieve a slightly bigger market share at the beginning. The videostores did not want to offer two different formats (the reason was storage space: within a situation of two systems one movie needs twice as much space than in a single system situation) and the consumers wanted no obsolete recorders - so everyone was encouraged to go with the market leader. Therefore the tiny initial difference grew rapidly. (Arthur, 1990)

Arthur explains that "*When two or more ..... technologies compete ....., insignificant events may by chance give one of them an initial advantage in adoptions. This technology may then improve more than the others, so it may appeal to a wider proportion of adopters. It may therefore become further adopted and further improved. Thus a technology that by chance gains an early lead in adoption may eventually 'corner the market' of potential adopters, with the other technologies becoming locked out.*" (Arthur, 1989, p. 116) So it is partly a matter of luck or chance to prevail. But this also means that this adoption process may select a technology that is not necessarily superior to its alternatives:

When we now go back to our first empirical example and examine why the QWERTY standard was developed we find out that this was done specifically to slow the typists down because early typewriting machines had the tendency to jam if the typist wrote too fast (Waldrop, 1992).

"... *the economy might become locked-in by 'historical events' to the monopoly of an inferior technology.*" (Arthur, 1989, p. 117)

It should be mentioned that it was not Brian Arthur's intention to prove with his theory of increasing returns that a competitive system is inferior compared to monopoly-like situations. The theory simply tells us that competition is no guarantee for an optimal solution (Arthur, 1990).

It is not necessarily true that the successor is the virtual money with the most superior technology or the one with greatest value stability or both. An inferior virtual money could also win.

The most important question for suppliers of virtual money is: How can a virtual money system be impacted to gain the early advantage in acceptance? Of course Arthur's '*historical events*' cannot be planned, but there are some impact factors which increase the possibility of success:

- User friendliness of the system

First of all such a system has to be extremely user friendly - in operation and in installation. Payment has to be done by a 'click and pay button'. The same is true for installation (Schwickert, 1996).

- Marketshare of the issuing bank

Right now buyer and seller must have deposits at the issuing bank (Merz, 1996). Therefore a software company producing virtual money systems should seek for a partnership with a bank that holds a dominant market share. If many people hold an account at the issuing bank the probability that many people will use this system is without doubt higher.

- Nationality / Region

Surveys show that for instance Europeans are in general far less interested in electronic commerce and interactive services than people in the United States (Lynch and Lundquist 1996). For that reason a software company producing virtual money systems should choose as partner an American Bank that holds - regarding the previous point - a great market share in the United States. Therefore even an European software company should try to enter the US market.

This list of impact factors which help a virtual money to prevail does not claim to be complete. It simply shows some important points. At last the choice is always made by historical events which are - at least partly - a matter of luck and chance.

## Conclusions

As we have seen there is no rule that tells us if a monopoly-like issuing situation or a competitive one is better for virtual money. In a monopoly-like situation we can minimize the transaction costs, but we have to live with all the deficiencies of a monopoly. On the other hand, competition eliminates the disadvantages of the monopoly but transaction costs occur. Unfortunately transaction costs do not come alone. In contrast to what Neoclassical theory tells us, the prevailing money is not necessarily the best. Because of random (historical) events which can be regarded as luck or chance it is possible that an inferior virtual money dominates the market.

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