NATIONAL PRIVATE MULTI CURRENCY SYSTEM SET UP

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ABSTRACT

As long ago as 1961 Robert Mundell proposed the introduction of many currencies in one country to deal with regional imbalances via fixed exchange rate adjustments. The purpose of this economic policy approach was to stabilize the national economy. However, this interpretation of the initial idea was long forgotten and never came into being. The reason may be attributed to many factors, mainly internal ones and the fact that the traditional form of money was a significant impediment for introducing a multi-currency monetary system in any national economy. This situation seems about to change, due to the emergence of virtual forms of money.

The aim of this paper is to present an analytical framework for studying the economics of a national multi-currency monetary system in an open economy model. The core idea is to introduce a virtual form of money and make it the sole means of payment in all kinds of transactions. We offer a solution that grants high stability of the external value of the domestic currency. Agents issuing the virtual currencies domestically are industrial and financial conglomerates, for which currency issues are backed by their fixed tangible assets and credit expansion is restricted by revenue.

It seems to us that the proposed system is an acceptable response to the increased variability in external factors that are detrimental to domestic stability. There are additional consequences of the multi-currency system that are discussed briefly.

Key words: private multi-currency system, monetary policy, virtual money.

JEL Classification: E51, E58
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1. INTRODUCTION

The multi-currency monetary system of private virtual means of payment that operates as a parallel monetary system for the traditional one is an original idea, although it is not far from the Optimum Currency Area (OCA) theory. By introducing private virtual currencies, issued by capable corporations, it is possible to influence the domestic currency exchange rate dynamics, and the mechanism of equilibrium exchange rate development under free floating. The initial intuition that this systemic change of the domestic monetary system would give incentives for depreciation of the domestic currency, and so could be a substantial and long-lasting depreciation factor, is fully justified. However, this perception should not cloud the vision of the ultimate goal that is, achieving higher internal and external economic stability and shock spill-over-resistance.

In modeling a small open economy to capture the introduced idea of a domestic, private multi-currency monetary system, several crucial issues need consideration. First, the credibility of the issuers of the private currencies. Second, the rules for issuance of private currencies. Third, extension of credit denominated in private currencies. Fourth, convertibility of private currencies. Fifth, costs and benefits of the proposed system. These issues form the main content of this paper.

2. THE MODEL – CLOSED ECONOMY CASE

The national economy is composed of three categories of agents. There is a government, represented by a central bank (B) in the area of monetary system management. There are legal entities – corporations (C) – that employ citizens and provide goods and services using capital and labor. The third category of agents covers natural persons (N), the citizens that provide labor to corporations and represent consumption demand in the economy. The circular flow of resources, production and payments, with a central bank providing liquidity to corporations is presented in the figure 1.
The transactions between producers (C) and citizens (N) require money functioning as a mean of payment. The initial provider of the legal tender is the central bank (B). Money supply (M) in the first period is set at a quantity \( m_1 \) according to the rule, derived from Fisher’s Equation:

\[
M = T \cdot P / V
\]  

where: 

- \( V \) – money velocity of circulation
- \( P \) – price level
- \( T \) – number of transactions

In the first period the economy is closed. Money demand is represented by the domestic agents and composed of transactional and precautionary elements only. There is no speculative demand for the legal tender. With the money velocity (V) constant, the monetary policy rule aimed at price stability (P-constant) requires the central bank to match real money supply (M) growth rate with the real GDP (T) growth rate.

In the second period the economy is still closed, but a stock market (a financial market) emerges. Corporations (C) issue and sell shares to gather resources for further development and expansion. This adds a new element to the domestic money demand – demand for a means of payment to service transactions in the financial market. Holding money supply fixed, as decided by the central bank, results in decreasing money stock available for real transactions. Monetary expansion is necessary in order to maintain price stability and avoid downward price adjustments (deflation). The question is: by how much should money supply be extended to match the additional demand for money, and to maintain the previous ratio between prices, real transactions and money velocity. The part of the money stock engaged by the financial market moved from savers (N) to corporations (C). It was spent on investment in production.
capacity, creating (fixed) tangible assets of value (A). This way corporations acquired items that may represent a very convenient and credible collateral for issuing their private currencies.

**Figure-2: Circular flow in the economy with a financial market and private currency**

\[ M + A = T * P / V \]  
(2)

where: 
- A – the value of the fixed tangible assets (historical cost).
- \( V \) – money velocity of circulation (assumed to be constant)
- \( P \) – price level (intended to be constant)
- \( T \) – number of transactions

Corporations introduce private currencies to the domestic monetary system via payments to their employees. The value of this new money is pegged to the initial sole domestic currency at 1:1 ratio. There is no reason for exchanging private currencies into central bank’s one as long as all domestic entities accept this new mean of payment. However, in case of such an exchange transaction, credibility of the fixed exchange rate is not questioned due to full backing of private currency by fixed tangible assets of the issuers.

To make this monetary system operational, the variety of private currencies must not create excessive transaction costs for bearers nor for accepters. The most efficient solution would be zero transaction costs. Therefore, the private currencies take the form of electronic money only. There is a variety of benefits flowing from using this form of money, elaborated...
already in the literature (see Fullenkamp and Nsouli 2004 for a review of this literature and Mas and Kumar 2008 for a discussion of social issues). A crucial precondition, however, for this system to operate smoothly is the presence of an infrastructure, both hardware and software that allows and facilitates all economically justified real transactions (Mas and Rotman 2008).

3. IMPACT OF PRIVATE VIRTUAL CURRENCIES ON MONETARY POLICY

The proposed model for an economy with private virtual currencies offers a new approach to monetary policy. Few futuristic opinions in the literature converge with the point of view presented here. It was Kobrin (1997), who concluded there is a general trend of diminishing significance of national authorities of all kinds. As one of the reasons, he proposed technological advances, including in the area of money and payment systems. Our paper delivers a number of contradicting arguments to most of the earlier projections in the literature.

According to Griffith (2004, p. 50), views of the impact of electronic money on monetary policy are 'quite varied'. Ely (1996) in his seminal paper claims that there will be no influence on monetary policy, except for the loss of seignorage for the federal government. As a consequence, budget balance would deteriorate with all its repercussions for monetary policy. On the opposite side, there are authors (Economist 2000, Matsumoto 2004) that forecast the twilight of central banking and of government itself. The monetary system setup presented in our paper leads to the conclusion that the influence of virtual private currencies on monetary policy will not be NIL. On the contrary, the organizational and institutional framework necessary for the idea to allow private corporations to issue their own monies brings new challenges for a central bank and its stabilization policy. Our simple model, and the associated analysis, reaches the conclusion that the efficiency of instruments used currently by monetary policy may decrease. There is also a substantial divergence of our findings from the literature in the area of: (1) monetary control and (2) monetary autonomy. Despite what is argued by Cohen (2001), introducing private virtual currencies and allowing for credit expansion denominated in these monies is going to reduce greatly the monetary control and monetary autonomy of the central bank. The reason for this feature in our framework is the relative independence of domestic transactions (payments) from the quantity of government money (issued by a central bank) in circulation. The projected monetary control with electronic money is elaborated further by Goodhart (2000), but it does not cover a problem of private

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1 Monetary control is defined as the ability of the central bank to shape monetary aggregates. Monetary autonomy, on the other hand, means the ability of the central bank to influence output and prices.
money issuers that is pertinent to our model. Griffith (2004, p. 54) states a condition for the significant influence of private virtual currencies on monetary policy, which is its circulation in a central bank realm. This is in turn a crucial feature of the system proposed in the current paper. The money supply and the effectiveness of a central bank to influence short-term interest rates would be, therefore, greatly limited. Market forces and free interplay between money supply and money demand would be responsible for setting interest rates in our analytical framework.

In particular, the system proposed in this paper is NOT going to influence demand for central bank reserves in any significant manner. Berentsen (1998) argues that additional liquidity in the national economy caused by creation of virtual money will result in a permanent increase in bank reserves. This is caused by the creation of new, independent currencies, which perform the same functions as central bank money. This is not simply by converting central bank money into electronic substitutes, which leaves liquidity unchanged, as we observe nowadays. An additional argument is that the mechanism for extending loans in private currencies creates more purchasing power at the disposal of issuers and of society as a whole. Switching from central bank money to private money also includes credit money, which creates this difference in demand for central bank reserves.

In addition it is evident that the European Central Bank’s concern about diminishing usefulness of monetary indicators (different information content) is fully justified and is, in fact, present in our proposed framework (European Central Bank 2000). Expansion of the money stock in circulation within predefined limits may seem a serious threat for efficiency in achieving central bank’s goals. However, restricting private virtual currencies to domestic use answer the worries formulated by Tanaka (1996). As long as virtual money remains a domestic means of payment, there is no reason for conflicts between their issuers and central banks.

There is no doubt that an independent payment system creates a monetary policy problem, making it definitely less effective. This could be presented as a gradual, but permanent pivotal shift in the LM line, representing equilibrium in the money market (Figure 3). The decrease in transaction costs, resulting from using electronic forms of money, leads to several waves of effects. In the first wave, average cash balances are significantly reduced. Then, we should note the much better access to financial instruments offering a non-zero rate of return. As a consequence, the opportunity cost of holding money is relatively higher. This in turn makes money demand much more sensitive to the interest rate. And the last, but not least, effect is the positive productivity shock, since electronic money (and the new payment system) is a time-
saving technology plus offering additional income from savings. Therefore, output should increase due to the release of additional resources that become available for productive utilization, and due to the direct income effect that allows demand to expand. Consequences of all three elements for equilibrium in the money market, and for the whole national economy in the standard IS-LM model, are presented in Figure 3.

**Figure-3: Macroeconomic effects of introducing private virtual currencies**

![Graph showing IS-LM model](source: Authors)

Flattening of the LM curve means moving into a liquidity trap, when monetary policy becomes ineffective for adjusting short-run output (loss of monetary autonomy, as defined by Goodhart 2000). At the same time, fiscal policy becomes much more effective in stimulating the economy.

As pointed out by Fullenkamp and Nsouli (2004, p. 17), the interest sensitivity of the LM curve varies depending on the relative proportions of private and government money in the total money stock. In the case where electronic money is simply purchasing power converted into an electronic substitute for coins and banknotes, like M-PESA in Kenya (Mas, Morawczynski 2009), it does not have the potential to induce such a change. The reason is because it does not increase the money supply available for transaction and speculative uses. The central bank still has the option to aggressively ‘sterilize’ the effect of introducing private virtual currencies, but this would be possible only in the short run. Otherwise, the LM curve will flatten (Figure 3), leading to less effective monetary policy.

We propose a simple open-economy model for the domestic monetary system. There are five actual free markets and one regulated market. The five free markets cover: (1) private money market, (2) government money market, (3) private money loan market, (4) government loan market, (5) government money exchange market. The regulated domestic exchange market (DEX) is an exchange market for private/government currencies that are exchanged at
par (i.e. 1:1). Restrictions in this market refer to agents and prices. Only residents of the national economy are allowed to trade in this market. Exchange rates between private currencies and between private currencies and government money are set at 1:1 ratio for each pair. However, due to a risk of business failure, and disappearance of some private money issuers (and for disappearance of collateral for money issue) it is necessary to maintain the exchange in the form of a separate market in order to control for potential defaults and bankruptcies of private issuers. This “just-in-case” facility is intended also for supervision over the whole private monetary system, including the payment system and credit expansion in private currencies.

Government money is provided via the banking sector. Money (of both providers) exists only in a form of non-interest-bearing checking accounts. Citizens supply deposits that are held at those accounts. The accounts are offered both by banks and by private money providers (corporations). Banks hold demand deposits and supply loans in government money only. Corporations demand deposits and supply loans in private money only. Corporations have a choice between bank loans in government money for financing spending on imports, and loans in private money for financing domestic investment or current expenses. At the same time, corporations supply loans in private money on the basis of deposits received and within limits set by the current revenue. Following a standard formulation for money supply, the deposits in private money depend positively on the aggregate level of income, \( Y \), as well as on the rate of interest offered on private money deposits \( r_p \), and they depend negatively on the rate of interest offered on government money deposits \( r_G \). The demand for private money deposits depends negatively on the rate of interest paid on these deposits.
Figure-4: National monetary system of 6 markets

On the basis of the graphical formulation of the six markets for private and government money one can conclude that demand for: private money, loans in private money, and private money in the exchange market are all interest-rate/exchange-rate sensitive. For supply in the private money market and in the private money loan market there is non–zero interest elasticity only for a closed interval. When the supply of private money and credit expansion in private money reach their respective predefined limits, supply lines \((S_P \text{ and } S_{PL})\) become vertical, as in figure 4. As long as private and government monies are perfect substitutes, the respective prices in all six markets should be the same pair wise. Otherwise, crowding – out of good money by bad money will follow (Copernicus-Gresham Law), and the monetary system will collapse.

Interest paid on deposits denominated in private and government money must be the same, as long as free exchange of each kind of money into the other is permitted by one or all of the issuers (government & corporations). Therefore, any shift in \(S_G\) must be matched by adjustments in the private money market. Since the nominal value of private currency in circulation is precisely defined, and restricted by two guiding rules, one should expect a

Source: Authors
response of \( D_p \), when government injects liquidity into the national economy and lowers the interest paid on government money deposits. However, when monetary expansion occurs in private currencies and \( S_p \) shifts to the right, this is a sign that the economy expands (either by investment in fixed tangible assets or in terms of revenue). This increases the supply of private monies, and pushes down the interest rate paid on deposits. Response of the government in the money market must follow, and monetary expansion in government money takes place (\( S_G \) shifts to the right). One may say that there is no symmetry in the market response.

The other market is the loan market. One will observe here a similar lack of symmetry in market adjustments. This is caused by limits in credit expansion that refer only to loans denominated in private currencies. However, this asymmetry grants compliance with the initial assumption, and achieves the ultimate goal – to maintain government and private money as perfect substitutes. Increase in demand for loans denominated in private currencies \( D_{PL} \) raises the interest rate, since the supply of these loans is restricted by the guiding rule based on the revenue of corporations (and available resources in the form of deposits denominated in private monies). Supply of loans denominated in government money will drop, and should result in increasing the interest rate on these loans.

Convertibility of private currencies and mechanics of the exchange market represent a non–trivial conceptual challenge in the model. The private currencies are designed and intended for domestic use only. However, to achieve the goal of maintaining all kinds of money as perfect substitutes requires, in an open economy setup, a convenient convertibility scheme. The exchange market for private currencies, considered together as domestic private money, must mimic the foreign exchange market for government money. It results not only from regulations but also from rational choice that loans for financing imports are extended in government money. It is enough to assume non–zero transaction costs for exchanging currencies to rule out loans in private money as a mean of financing imports, when all kinds of money are perfect substitutes. When one considers the private money exchange market – \( DEX \) – (exchange into a foreign currency by the vehicle of government money), demand for foreign currencies (government money) has an upper quantitative limit, defined by the private money stock. After reaching this point, the demand line becomes vertical and the demand becomes exchange-rate inelastic.

To maintain a clear and sharp picture of the foreign exchange market for private currencies via the vehicle of government money, the following elements must be explained. The exchange-rate between private money and a foreign currency, in Figure 4, is defined as the number of units of virtual private currency for a unit of foreign currency. Depreciation of
domestic currency is depicted by moving the market–clearing exchange-rate up, and appreciation is reflected by the opposite shift. The private money exchange market is mimicking the government money foreign exchange market developments. Due to the virtual form of all money in the national economy, it is possible to assume zero-transaction costs for this two-stage exchange from private money to foreign currencies. This operational solution is intended to give a convenient and efficient instrument to the government for controlling financial flows and maintaining, to some extent, monetary autonomy and monetary independence. Together, with the 1:1 exchange rate between private and government money this solution should ensure successful operation of the whole national monetary system.

4. CREDIT EXPANSION IN THE VIRTUAL PRIVATE MONEY SYSTEM

It is time to present rules for money issuance, and extending loans denominated in private virtual currencies. It would be immaterial to set limits for both, because in such a case the foreign exchange market would discount this information and speculation would be present not only on government money but also on each and every of the private virtual currencies. This speculation would be based on a conviction that the limits will be extended, or there will be a realignment of the hard peg between private currencies and the government money. It would be a disaster for sure. Therefore, it is reasonable to utilize the idea originating from the commodity money concept, of the collateral that backs each issue of private currencies 100%. If there is collateral that backs the whole issue (case with no loans) then nobody (no speculator) would question the credibility of the fixed exchange rate between private currencies and the government currency. This way there would be no speculation in private currencies.

Let the nominal value of each electronic issue increase with the production capacity of each corporation. Production capacity proxy may be the fixed tangible assets value taken directly from the balance sheet. According to international accounting rules, the valuation rules of this group of assets result in under–valuation. However, this should represent no problem, and benefit the viability of the proposed system by increasing the credibility of the private money issuers. The idea is to use highly illiquid assets to be the collateral for the electronic money issue because their stable value makes them good collateral.

Extending loans, or creating money that has no collateral in fixed tangible assets could depend on two factors:

- term of the loan,
- projection of the term structure of revenue.
Although revenue is highly volatile it represents economic value and may be forecasted. Therefore, with economic expansion there would be many more loans in advance of the actual revenue recorded in corporate accounting books. More virtual money in circulation would push the supply function down, exerting downward pressure on the JPY/USD exchange rate from the moment loans start to increase. This is an original idea because this mechanism would provide significant support in case of unexpected economic problems of any kind. As long as events are unexpected and not included in forecasts, there would be no decrease in loans in advance, and internal demand would not fade.

5. REGULATION OF PRIVATE ELECTRONIC MONEY

The problem of appropriate regulation in the area of private virtual currencies has been discussed in the literature for a long time. A pioneer was Tanaka (1996), who proposed to establish a new, separate institution to control electronic forms of money, no matter who issues them. The reason for potential problems for the economy and society is the emergence of an alternative and independent payment system. Central bankers point out the reason – the lack of any control of the central bank over private money (Friedman 2000, Freedman 2001). This creates a systemic risk, moral hazard and a problem for the central bank in active monetary policy.

Private virtual currencies may pose a substantial systemic risk, if left entirely unregulated. The problem is the potential for over-issuance. One should expect then a standard run on the private issuer, and/or gridlock in the alternative payment system, when private currency is no longer accepted. Therefore, rules and limits for private money supply were introduced at the very beginning of the paper, both for currency backed with fixed tangible assets, and for credit money depending on the time structure and value of revenue of corporations.

Moral hazard appears when the central bank performs the function of lender of last resort for private money issuers. However, with the defined rules and limits for the nominal value of issue of each corporation there should be no problem in this regard, even when the central bank guarantees convertibility of all private monies at par to the government money.

In order to prevent removing the government money from circulation by private currencies, a regulation on settling obligations with the government with its money is necessary. An alternative solution, present already in the literature and tested in real life as an efficient way of dealing with co-existence of private and government money, is redeeming
private currencies for government money at private issuers by the central bank on behalf of the ministry of finance.

6. RESPONSE OF THE FOREIGN EXCHANGE MARKET TO INTRODUCTION OF PRIVATE CURRENCIES

At the moment of introduction of the new domestic monetary system, based on private virtual currencies, one should expect several significant adjustments in markets operating in the economy. The standard set of responses for a monetary expansion is obvious. One should list here interest rate decrease and real effects on output and employment. Despite these stimulating impulses, the exchange-rate of government money should experience a serious depreciation. The reason for such a response of the foreign exchange market lies in the significant change in the supply of means of payment for domestic transactions. With the introduction of private currencies, a substantial share of government money in circulation in the national economy will become unnecessary over time.

The creation of the new monetary system is a process. Issuing private currencies, within the limits, and introducing them to society for use in everyday transactions results in a gradual increase in the total money stock available for domestic transactions. It is expected that society will follow the idea of specialization for each kind of money, and will prefer to use private currencies for domestic use and government money for external purposes (imports, traveling, investing abroad). In fact, due to the virtual nature of money, the difference between monies will not be distinguishable in everyday use. Only when external transactions are involved will exchange restrictions apply. Private sector employees will receive their remuneration in private currencies, while public sector workers will receive wages and salaries in government money. Domestic transactions serviced in a growing part by private currencies will release with time more and more of the government money for all other purposes, including the broad category of external use. The supply of government money in the foreign exchange market will follow, and a long-term depreciation trend will be initiated.

The mechanism responsible for such a response of the foreign exchange market is based on domestically-restricted monetary expansion. Employees of private sector companies paid in virtual private currencies would spend them for (1) everyday living expenses and (2) for foreign trips, after exchanging private currency into government money and then into a foreign currency.

Such a setup offers a significant change in the domestic demand function for money. There is a much lower demand for government money for domestic use (transactions), because companies and their associates and employees use corporate private virtual currencies. It
means that government money in circulation is now in excess of the actual transactional demand which, in effect increases the total supply of this money, including the supply in the foreign exchange market ($S_2$) for the national currency. The market for government currency is depicted in Figure 5, with its price defined in terms of the number of units of other currencies (vertical axis), and the quantity of government money supplied, and demanded, (horizontal axis). Lower demand ($D_2$) for foreign currencies in the foreign exchange market may result from the fact that corporations ($C$) could use their own currencies for internal international current and capital transactions (within capital/industrial groups). They may, therefore, circumvent the foreign exchange market, adding nothing to demand for government money ($D_2$). To present this effect one can use a simple graph (Figure 5).

Figure-5: Equilibrium exchange rate (number of units of foreign currency per unit of domestic currency) in the foreign exchange market for government money.

Source: Authors

Downward pressure on the exchange rate ($E_1$ $E_2$) (i.e. number of units of foreign currency per unit of domestic currency) is inevitable and long-lasting. This is therefore a viable mechanism to support stability of the exchange rate or stimulate a downward depreciation trend. For the real economy one should expect dynamic economic growth in the long run fueled by the depreciation.

To sum up this section, it can be concluded that the domestic economy will experience a very special monetary expansion. The uniqueness of this expansion is in its resistance to the so-called liquidity trap. Citizens can not hoard cash balances because there is no cash and they are paid in a currency that buys all goods and services domestically only. It can be invested abroad only after exchanging it for government money and then for some foreign currencies. This may make the “carry trade” diminish due to additional inevitable costs of dealing with
private virtual currencies, when exchanged in two steps (1) into government money and then (2) into foreign currencies.

The exchange rate of government money will drop due to two reasons: (1) abundance of government money that is no longer demanded by people using private virtual currencies for everyday transactions ($S_1 \rightarrow S_2$), and (2) lower demand for foreign currencies because corporations may use their own currencies for internal (within capital groups) international transactions ($D_1 \rightarrow D_2$).

There is another very important aspect of the whole external setup. One of the elements of the external demand for money is the demand represented by other central banks and other non-residents who wish to maintain foreign exchange reserves denominated in government money, but not in private currencies. Since only government money can be used by non-residents as a foreign exchange reserve currency – its relative increase in supply has potential to be another one-time stimulus to depreciation. Rational agents (central bankers from other countries) expecting depreciation of the government money will decrease their holdings of this currency in their foreign exchange reserves to avoid recognizing a loss on foreign assets. This would add to the presented depreciation pressures another reason for the postulated trend and adjustments.

The system viability requires therefore a certain form of exchange controls and restrictions. It is necessary to impose two rules:

- domestic use for private currencies,
- only residents are allowed to exchange private currency into government money.

These two elements rule out any speculation and grant the economy substantial stability of the domestic monetary system, both in money supply and in credit expansion. In addition, it is possible to introduce rules that foreign investors coming to the national economy for direct investments are treated in a different way than portfolio investors (speculators). This was already tested as an efficient way to remove speculation in the Common Monetary Area (Mlodkowski 2007).

7. CONCLUSIONS

The presented idea in this paper of a domestic private multicurrency monetary system may be perceived as a monetary union of enterprises. Unlike a monetary union of regions (or countries) the system is not intended to deal with regional economic problems and imbalances via fixed exchange rate adjustments. There is however a similarity to the OCA concept in the sense that private currencies are intended to maintain higher external stability and facilitate
prosperity. The proposed system operates as a parallel solution to government money, with restricted convertibility, but still permitting exchange of private currencies for foreign currencies.

As long as private and government money are perfect substitutes domestically, none of them should crowd-out the other one. There is however a threat that lax private issuing policy, with no limits, would bring moral hazard problems and would result in hoarding government money while spending private currencies intensively. Therefore, the paper offers clear and precise limits for money supply and credit expansion in private currencies. Collateral for private money in the form of fixed assets, and backing credit expansion with corporate revenue seem convenient guiding rules and economically justified principles. In this case the credibility of the private monetary system will neither be questioned nor tested by speculators.

The restricted convertibility of the private currencies is based on three rules. First, only a resident is allowed to exchange private currencies into government money. Second, only government money is convertible into foreign currencies. Third, private currencies and government money are exchanged at 1:1 ratio. This solution is intended to grant benefits for domestic agents and protect the external value of government money from foreign speculators. This is a form of protection by means of extending domestic money supply.

It has already turned out that the ZIRP and QEP policies did not manage to fuel economic recovery in Japan, and did not prevent systematic appreciation of the Yen. Instead, the carry trade developed and deprived the national economy of vital production resources (i.e. savings). Creating additional money for domestic use only has potential to revitalize investment processes, while leaving government money for use in the banking sector, foreign exchange market and stock exchange, plus as a foreign exchange reserve currency held by central banks in other countries. Making more government money available for external users has potential for lowering the exchange rate significantly. This is expected to be a one-time adjustment on the day of introduction of private currencies, plus a systematic depreciation pressure resulting from credit expansion in private currencies.

Introduction of private virtual currencies in the national economy is going to fuel economic growth due to several factors. First, it creates additional purchasing power that can be used to finance spending domestically without any loss in purchasing power. Second, private monies, after exchanging, may be used for spending abroad. However, this is at the cost of a loss in purchasing power, when depreciation increases foreign nominal prices. Rational agents will change their spending preferences, switching from foreign to domestic products. This leads to a third factor for economic expansion, that with the noted depreciation,
relative prices of domestic and foreign goods change and induce substitutive and income effects. These effects together contribute to domestic demand and will represent a substantial stimulus for the national economy. Therefore, the proposed system of private virtual currencies has the potential to generate a positive “demand shock” domestically.

The presented solution in this paper provides several benefits:

- protects the private monetary system from overissuance,
- protects the private monetary system from inflation,
- makes the private monetary system perform all functions of money, meeting all seven requirements for sound money,
- grants resists seasonal political changes, and protects the private monetary system from being used by politicians to achieve short-term political party goals,
- grants the private monetary system greater credibility than “fiat money” issued by the government,
- the private monetary system is for the use of society and only for society in the meaning that external agents are restricted in using private money, and it rules out any detrimental interference (i.e. speculation).

In addition to the listed benefits, households will decrease their propensity to travel abroad, and to shop abroad, due to depreciation of the domestic currency. The proposed multi-currency monetary system, with fixed exchange rate between private monies and government money, imposes loss of purchasing power to cash balances of private currencies along with depreciation of the government money. A direct consequence would be an improvement of the current account balance due to lower private consumption spending abroad. This postulated decrease in imports results from an income effect. Real income of domestic agents decreases when denominated in foreign currencies. Depreciation of government money increases (relative) foreign prices, which causes lower purchases than before. Imported goods and services become relatively more expensive, in comparison with domestic ones. Two microeconomic effects follow: income and substitution (Slutski identity). Both benefit the national economy by shifting demand from foreign to domestic goods, hence boosting domestic production.

An additional comment on the exchange rate between private currencies is required. Exchange rates are supposed to reflect the relative strength of issuers and therefore may be perceived as volatile units of value. This is justified by the fact that companies in different

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2 All spending abroad by tourists is recognized as “Imports of services”, according to the methodology for Balance-of-Payments compilation [IMF 2011].
industries own different (fixed tangible) assets. However, we are analyzing the equilibrium state. Equilibrium in an economy is achieved, when the marginal productivity of production factors is equal across industries. In such a situation, no labor flows and no capital flows occur. There are no adjustments resulting from differences in profitability across industries because such differences do not exist. Such a situation is associated also with equalization of wages and salaries – that are set at the marginal product of labor – that is assumed to prevail in the domestic economy. If the introduction of private currencies is done by issuers through payment of wages and salaries, the amount of money in circulation is supposed to be equal to the total sum of goods and services supplied by the national economy (an alternative interpretation of Say’s Law). Equalization of marginal products of labor, and wages means that the purchasing power of one unit of private currency, no matter the issuer, is supposed to be the same. Therefore, the 1:1 exchange rate between all private currencies is a natural consequence.

Another question may be: why several kinds of private currencies are needed, despite the fact that the difference between monies will not be distinguishable in everyday use? Distinguishing between companies of origin (issuers) for private currencies is necessary mainly for supervision purposes. Recognizing currencies according to issuer criterion, is necessary for limiting the total value of money issued. Since there is a motivation for over-issuing due to seignorage benefits, it is necessary to impose strict control on the private money quantity. For that, information on the origin of a particular private currency is necessary. The other consideration is a situation when a company-issuer is terminating its operations and it becomes necessary to remove from circulation the money issued by this particular issuer.

The introduction of a private virtual money system may lead to a substantial increase of stability by isolating the domestic economy from external factors. The threat of stagnation induced by the proposed monetary system does not find any support in the presented mechanics and rules guiding its operations. All residents of the national economy are allowed to conduct foreign transactions (current and financial). Foreign entities are also allowed to execute transactions within the national economy. This solution does not discourage trade with residents, nor foreign investment in domestic production capacity. Introduction of the proposed monetary system will boost the national economy. The reason for this claim is the seignorage received by domestic private issuers. As a result, an additional volume of purchasing power will appear in society. The current quantity of government money will be supplemented by monetary expansion restricted to national transactions. In the same time, this volume of actual private money stock will represent seignorage granted to issuers to be used in
domestic transactions. It is difficult to claim that such an expansion in purchasing power at the
disposal of residents would result in stagnation.

Currently electronic money has credibility because it is used on the basis of government
money (cash or deposit). It is possible that private currencies diminish the role of government
money. As a result, these virtual private currencies may start playing a key role in the
international monetary system. Overthrowing government currency by private currencies is
easily imaginable domestically. When the position of international currencies is considered,
there arises the question of a global infrastructure for payment and settlement that would make
it possible. Such a futuristic endeavor is beyond the scope of this paper; however, it can be
said that with the fall of the current concept of a state, a new consensus may emerge, based on
a global government composed of corporations that may issue their own money worldwide.
Political borders will be no more. The only division between parts of the world and between
citizens will be based on the criterion of their employers – corporations, and money-issuing.

Matsumoto (2004), foresees the end of the traditional state, with the advent of a private
multi-currency system. At the current stage, the question: “Is Virtual Cash a Reality” posed by
Griffith (2001) is no longer “to be answered”. It is already possible to design a viable domestic
multi-currency system, with government and private monies as perfect substitutes. Otherwise,
when the central bank is denied the sole right to issue the means of payment, other entities
may create pseudo–monetary union and sentence the traditional form of the state to death. The
most important advantage of this scenario is return to the free market economy and rejection
of any restrictions imposed by government that hinder sound management in the private sector.
It was also argued by Matsumoto (2004) that a private multi–currency monetary system would
produce exchange rate stability and improve social welfare. The former argument is supported
by the formal analysis in the previous sections of this paper, but the probability of the latter
benefit requires further theoretical studies.
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