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Zhou, Xinyi Jimmy

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A New Money Exchange System: The World Calorie Currency (WCC)

Xinyi "Jimmy" Zhou

Abstract: The current ruble crisis causes much trouble for many of those eastern European countries like Russia and its neighbour countries: Strong ruble depreciation and high inflation for consumer goods are its most negative consequences. Because the ruble is only a national currency, but not a world currency, some people might ask if we introduce a new global currency, the World Calories Currency (WCC) or "Cal-Money", that currency would be less vulnerable and less crisis-prone. In this short paper, I firstly present the 4 main criteria of a successful and widely accepted currency:

1. Fair volatility & high inflation security, 2. high trust and acceptance among the users, 3. high distribution over the world and 4. High supportiveness of the real economy. After I compared the strength & weaknesses of the World Calorie Currency and present some concrete measures to make the Cal-Money implementation more smoothly, I then came to conclusion that all 4 main criteria of a successful, worldwide applicable currency would be fulfilled by the WCC.

Keywords: Money Exchange System, World Calorie Currency (WCC).

1. INTRODUCTION

The Current Situation of International Currencies in the Monetary & Financial Market:

As we can see in the current news, due to political and social crisis in the Ukraine, Russia's ruble currency is under severe attack as its dollar value decreases very much in a short period of time¹, it has even a similar fate like the decreasing crude oil price which doesn't help Russia's already weak and damaged economy either. Especially those poorer people of the lower class and lower middle class are severely affected by the most recent ruble crisis, as the prices of goods of everyday's life increases drastically in Russia (high inflation). And because the social lower class (often factory workers or peasants) have less to loose than the other social classes, any annoyance or displeasure there could lead to big political unrest, violent demonstrations and in the worst case even to a civil war².

Because the crisis prone ruble is "only" a **regional** currency mainly used in one country (Russia), it's surely more affected by attacks of speculators and other financial market participants than let's say a hypothetical "world currency" (WC)³. With such a imaginary world currency, those currency crisis like the ruble crisis could be prevented or at least extenuated. And even when such a world currency isn't completely safe from outside attacks (especially if we introduce a floating exchange rate regime for our world currency relative to the other regional currencies like Dollar, Euro, Yen, Yuan, Swiss-Franc, UK-Pound etc.), its would be certainly inflation secure⁴.

A world currency (but not necessary a single global currency) mentioned above seems to be quite useful in reducing the negative effects of a currency crisis (e.g. inflation) but in reality it's not always feasible, for various reasons: Robert Mundell, the "father of the Euro", for example mentioned in his famous 1961 paper the criteria of a "Optimum currency

1 see Klikushin (2014)

2 Recently, also the Swiss-Franc, often an hard and stable currency, experiences big and turbulent *appreciations* (against Euro, Dollar etc), which also damages its national economy (e.g. export industry) and financial market (Inman, 2015).

3 The Dollar and the Euro are Nearly-World-Currencies (NWC), used in a very large part of the world but still not everywhere (for example not in very underdeveloped areas in the world that may only accept its own regional currency).

4 Why the new "World Currency" should/could be used simultaneously with other older regional currencies, why it's still not 100% secure of speculators & attackers, and why this shouldn't be a problem concerning inflation, those 3 important questions shall be answered at the end of the next chapter (Ch. 2).

area" (OCA), in which one currency can be successfully established⁵. But even a Near-World-Currency (NWC) like the Euro doesn't fulfill most of those OCA criteria (no perfect labour mobility in the EU countries, no similar business cycles, no homogenous preferences, financial equalization not always sensible in the long term etc.), and therefore the Euro is not always trouble-free and efficient for the adopter economies (Euro-Zone).

Other alternative currencies like the virtual currency "Bitcoin"⁶ is on the other hand only theoretically a world currency, but in practice the Bitcoins are only accepted by a few institutions and for a restricted amount of products: E.g. Microsoft accepts Bitcoin payments only for music, windows apps and computer games (and just in the US!), but not for core products like Office 365⁷.

Before we move on to the next chapter where a new World Currency concept will be introduced, it's very useful firstly to actually know the 4 general goals and features of a "successful" currency⁸:

1. fair valuable & inflation-secure
2. High trust and acceptance among the potential users of a population
3. High distribution all over the world
4. supportive of the real economy

2. A NEW (COMPLEMENTARY) MONEY EXCHANGE SYSTEM: THE WORLD CALORIE CURRENCY, ALSO CALLED "CAL-MONEY" (WCC, CC, CM)

2.1 Characteristics and definitions of the World Calorie Currency (WCC):

In order to get a better understanding of the newly proposed World Currency, the "World Calorie Currency" (WCC), we should first introduce some new definitions and concepts like the "Life Value", which only those products possess that **satisfy our basic needs for living** and are containing calories. So basically with the World Calorie Currency or "**Cal-Money**" (WCC, CC, CM), we can "only" buy goods which are containing 1.fat, 2. carbon hydrate and 3. protein and therefore are also burnable. Typical examples of calorie-containing products are all sorts of food like meat, fruits, vegetables, eggs etc. but also often used industrial commodities like oil, coal or wood. Even electricity and alcohol consumption can be measured with the energy unit "calorie" and thus can be justly acquired with the new "Cal-Money". All in all we can say that the Cal-Currency could be mainly/at best used in the 1st and 2nd economic sector (agriculture and forestry sector, industry sector), where calorie-containing goods can be physically and visibly created⁹.

Another characteristic of WCC which can be a huge advantage compared to other "normal" currencies (Dollar, Euro, Yen etc.) is that the Cal-Money are not issued with a "Gold coverage" concept but with a more life-essential "**Goods coverage**" which means that for example a countries central bank (US, UK, China, Japan, Euro-Zone, Switzerland etc.) can only issue a fixed amount of Calorie Money which is strictly dependent on how many calories this countries economy is able to produce: E.g. if the US produced 100 Million calories in year 2014, for inflation reasons, its central bank are only allowed to print Cal-Money in the value of about 50-100 Million calories in the same year etc¹⁰.

Because the World Calories Currency (WCC) are both **imperfect substitutes and imperfect complements**, the Cal-Money are flexible and parallelly applicable with all the other "normal" currencies in the world like US-Dollar, UK-Pound, Euro, Yen, Renminbi-Yuan, Swiss-Franc, Ruble etc. and that even with all those calorie-containing products (which we could theoretically acquire exclusively with the Calorie Currency).

5 see Mundell (1961)

6 see Nakamoto (2008)

7 see Warren (2014)

8 We will get back to those criteria in the end of our paper (ch. 4).

9 In order to get a higher adoption rate of WCC also in the 3rd economic sector, the service sector, some new methods need to be invented to **measure the calorie consumption** in providing those services more exactly, primarily for those physical workers (blue collar workers), but maybe also for those intellectual workers (white collar workers).

10 Even if we are determining in advance, that those food and energy producers aren't allowed to calorie-price their products higher than they actually are worthing in real calories (for practical reasons), it will still be better for a country to bring out *less* Calorie Money in the introduction phase than the annually produced calories (e.g. 100 Million Calories p.a.), to reduce the danger of *transferred* inflation (from the Cal-Money to the country's normal currency). That's because besides the WCC, we can also use the normal currency (Dollar, Euro, UK-Pounds etc.) to buy some of those produced 100 Million calories in that year.

2.2 Usefulness (and disadvantages) of the World Calorie Money:

First of all, there are many **benefits** of the World Calorie Currency:

1. The WCC is very **inflation-secure** unlike normal national currencies and other alternative (online) currencies like the BitCoins. The first reason for this is that the Cal-Money is a "Measure-Currency" which means that its core values are fair and objectively measurable on the basis of their calorie content (units: cal, kcal etc.) which are mostly scored on the calorie-containing, burnable goods (food, oil, wood, coal, electricity, alcohol, etc.). Thus the "monetary" value of the calorie priced goods (in the home country) isn't dependent of the producer countries supply and demand which makes the home land WCC prices of calorie-containing products very stable.

Another reason for high stability/inflation security of the Calorie Money is that the issuer of WCC (the central banks of each country) are using the concept of "Goods coverage" (not the usual Gold backing) which implies that a certain country can maximally issue so much Calorie Money which this land is able to produce during a year (e.g. 100 Million Calories etc.)¹¹. So even if the exchange rates between WCC and the other countries currencies (Dollar, Euro, Yen, Yuan, Ruble, Swiss Franc, UK-Pound etc.) are not fixed and theoretically not immune to attacks of speculators (like the Ruble in the recent time), even a currency crisis of the WCC won't cause a big inflation problem with the same currency, because even though the WCC are losing value compared to the other normal currencies, the calorie value of each calorie-containing product will always stay the same and are still acquirable with the same amount of Cal-Money just like before the currency crisis¹².

2. The second advantage is that the Calorie Currency would be brought out by the **central bank** of each country willing to introduce the WCC (which for example wasn't the case for the BitCoin alternative money) which implies that it would have a **high acceptance** (adoption rate) in the population.

3. The World Calorie Currency could theoretically **applied in every country in the world**, because it is a global currency (but not necessary the single useable one). That is because the calories of an orange is roughly the same for all countries, no matter if it's grown in the USA, Europe, Asia, Africa or Australia.

4. Furthermore, because the WCC is **more of a currency complement** than a currency substitute, the usage of WCC is **highly flexible**, because it is parallelly useable with the countries normal currencies. Online trading is also possible and should be encouraged in the introduction period.

5. Another very big benefit of WCC is that it supports the production of the calorie-containing goods of the **Real economy** like agriculture/food industry and the energy industry (oil, coal, wood, electricity). That's because the more calorie a country produces per year, the more Cal-Money can this land print¹³.

6. Countries with very hard and even overvalued currencies like Switzerland (Swiss Franc) and maybe also China (Renminbi-Yuan) etc. could parallelly use the Calorie Currency to "weaken" their national currency in order to **increase their exports**.

7. Last but not least the Cal-Money can be **health-increasing** due to its exactly calculable nature, so if a person wants to keep an eye on his figure and possibly make a diet, using the Calorie Currency be very helpful since before he goes to the supermarket to buy some food, he can set a maximal calorie restriction (e.g. 2000 kcal) by only taking WCC in worth of 2000 kilo calories with him.

As many benefits the World Calorie Currency has, it has also **some disadvantages**:

1. With the Cal-Currency, **we can't buy all products** in the world, for example those goods with a "Life value" of zero calories (0.0 cal) aren't directly acquirable with the WCC (e.g. metals like gold, silver, platinum etc. but also other life-essential goods like shoes, clothes etc. and also water). So those non-calorie-containing products have to be bought with normal national currencies¹⁴.

11 compare chapter 2.1 for the more detailed explanation of "Goods coverage"

12 And also the country's normal currency (Dollar etc.) won't inflate very much in case of a hypothetical WCC crisis, because due to the high stability of WCC home prices, there won't be much capital flight neither from WCC to the normal home currency (e.g. Dollar) nor to the other foreign currencies (Euro, Yen,...).

13 In order to reduce the inflation danger (of transferred inflation to normal currencies) and in line with the concept of "Goods coverage", the central banks shouldn't print more WCC than its annually calorie production (e.g. 100 Million calories).

14 But if the Cal-Money is simultaneously used with the country's normal currency (Dollar, Swiss Franc etc.) and the exchange rate

2. Another (minor) disadvantage is that some calorie goods like **oil are extremely calorie-rich** which could lead to value distortions because it's too expensive to buy oil with the WCC (possible solution: use normal money for buying oil products).
3. Since the WCC are simultaneously used with the countries normal currencies, the **complexity** rises also, either for the user but also for the issuer (central banks)¹⁵.
4. On the contrary to the BitCoin, the other famous alternative currency, the Calorie Currency isn't independent from the central banks. But then again that's also not the case for all the normal national currencies¹⁶.

3. THE CONCRETE IMPLEMENTATION OF WCC

After stating the main benefits (and also the disadvantages) of the World Calorie Currency, it's time to tell how to concretely implement this new global currency.

Firstly, it's clear that unlike the BitCoin, the WCC should be issued **with help of the central banks** of each country, simultaneously with that country's normal currency¹⁷. And of course this must be done with applying the often mentioned "Goods coverage" (not Gold coverage!). In the introduction period of WCC, this food and energy industry money should be brought out from central banks of such countries whose currencies are **"hard and stable" currencies** just like the US (Dollar), UK (Pound sterling), EU(Euro), Japan(Yen), Switzerland(Swiss franc). After some running-in time, those leading emerging market countries like Brazil (Brazil real), Russia (Ruble), India (Rupee), China (Renminbi-Yuan) and South Africa (South African rand) etc. can follow up with issuing their WCC money.

In order to make sure that those new Cal-Currencies are implemented with **uniform standards**¹⁸ in each of those adopter countries mentioned above, it won't hurt to either found a new higher international control instance or using the already existing international monetary organizations like the IMF or World Bank for this task.

To increase the attractiveness of the WCC for the investors, I suggest choosing **flexible exchange regimes** in order to ensure that there are always some speculation possibilities between the Calories Currency and the countries normal currencies.

We may **start with online trading** of WCC in the introduction phase (like the Euro for example) and then broaden the WCC's usage afterwards to real paper & metal money exchange systems. Due to differentiation reasons, the issuer of non-virtual Cal-Money might even (uniformly) choose **other forms and colors** for the metal and paper money (square or oval form for WCC bank notes & WCC coins, food & energy-specific colors etc.).

Finally, we shall address the question of how and from where those Calorie Money could concretely be distributed to its end users. The answer is simple, of course **from firms and companies where those WCC end users work** (and from unemployment insurance for those people out of work). The Cal-Money should be distributed in form of employee wages which is now partly paid in normal currency and partly in the new WCC money. Especially for the WCC wage compensation part the firms should use the **needs compensation principle** of those calorie consuming firm workers, so if for example a factory worker needs 2000 kilo calories per day, you must pay him at least $2000 \times 30 = 60000$ kcal in WCC per month¹⁹.

between WCC and e.g. Dollar is given, then we could even "directly" buy that product there (for example in the USA), *even* if those goods aren't calorie-containing (no "Life value"). *Another* (even better) approach is, to allow the WCC to be used to buy also the non-calorie-containing products (e.g. a watch), whose prices are a. solely determined by supply and demand (no resource backing) or b. backed with precious metals like gold, silver and bronze.

- 15 Also the fact that calorie-containing products (e.g. food) which are used for backing the monetary Calorie Currency are not very long-living, it could be a serious challenge for the WCC issuer (e.g. central banks) to cope with this problem.
- 16 Another possible outcome after implementation of the WCC (which is neither a benefit nor a disadvantage) is that the Calorie Money could lead to *price convergence* of food and energy prices across the countries stated in normal Non-WCC currencies.
- 17 Of course we shouldn't completely rule out the possibilities of decentralized WCC generation (like BitCoins) and trading in the introduction period, especially when the Cal-Money is only implemented as an online currency at that time (e.g. as "CalorieCoins"). But the central banks need to join in at the latest, when the WCC's utilization is broaden to real paper & metal money exchange systems.
- 18 Uniform standards means, that the WCC is absolutely the same (design, feeling etc.) for all adopter countries in the world, thus there won't be any value differences between a 1000-calories note in the USA and the same Cal-Currency note in China.
- 19 Those people who are arguing that the "needs compensation principle" isn't very fair to those employees who are working harder and are working with a higher calorie usage have to consider that it's far from easy to exactly measure the calorie consumption

4. CONCLUSION: SHOULD WE USE THE WCC, AND HOW COULD WE DO IT?

In the last part of our short paper, let's draw a final conclusion, whether we should really use the World Calorie Currency (WCC) and how could we do it in order to get a maximum adoption rate. For this purpose we have to get back to the **4 main criteria** for a "successful" currency (end of chapter 1):

1. Fair valuable & inflation-secure: The WCC fulfills the first very important (set of) criteria. Of course the Cal-Currency is very fair and justly valuable, because the WCC issuer & goods producer has always to make sure that the **monetary calorie value** of the WCC has to **equal the real calorie value** of those goods which can be bought with the Cal-Money. Since the WCC issuer (central banks) are also using the "Goods coverage principle" in printing the Cal-Money, this new currency is even then pretty inflation secure in case of a currency crisis (where that currency would depreciate very much in a short period of time just the ruble currency recently). Because even if the WCC would depreciate relative to the other national currencies, its calorie core value (e.g. of a 1000 calories bank note) won't change over time.
2. High trust and acceptance among the potential users of a population: The Cal-Currency also fulfills the 2nd criteria of a successful currency, because unlike other alternative (online) currencies (BitCoin), **only the central banks** are allowed to put out the Cal-Money which would ensure a rather high adoption rate in the population.
3. High distribution all over the world: Since the WCC should be a **globally used currency** (for all calorie-containing goods), also this criteria would be satisfied. Nevertheless, the Cal-Money isn't a *single* global currency but a world currency which can used simultaneously with other national and international currencies (Dollar, UK-Pounds, Yen, Swiss franc, Euro, Renminbi-Yuan, Ruble etc.).
4. Supportive of the real economy: Also the 4th feature of a highly successful currency is fulfilled by the WCC, because with the Cal-Money we can **mainly buy calorie-containing products** in the food and energy/raw material industry. And because of the "Goods coverage" of printing the Cal-Currency, the central banks are only allowed to maximally print monetary WCC worth as much calories as those countries' real economies were able to produce. Therefore, the more "real" calories the food & energy industry of each WCC-applying country were able to create, the more monetary calories (WCC) would that country's central bank be permissioned to bring out. And that is a very important incentive to make sure that those central governments would also support the real, calorie-producing economies, for example by subsidizing the peasants with giving them some extra monetary calories in form of Cal-Money.

Because all the 4 main requirements of a highly successful currency above are more or less satisfied by the World Calorie Currency, the main question now is not whether the WCC should be applied but *how* could we do it to maximize its adoption rate in the world population. As we have already discussed that very extensively (in Chapter 3), let's just present the readers a short and concise summary of the **main aspects & requirements** everyone must take into account in case of a concrete WCC implementation:

- The WCC should be issued from a governmental institution, the central bank and with uniform currency standards for all the adopter countries.
- The WCC should be brought out with the "Goods coverage" concept, i.e. no more monetary calories (WCC) than real produced calories (of real goods) in each country.
- The WCC should be firstly printed only in those countries with "hard and stable" currencies just like the US (Dollar), UK (Pound sterling), EU(Euro), Japan(Yen), Switzerland(Swiss franc).
- We should apply flexible exchange rate regimes between WCC and the other normal national currencies.
- We should firstly start with online trading of WCC, before we broaden the its usage to "real" paper & metal money exchange systems.
- We should apply the "needs compensation" concept, i.e. the calorie-consuming firm workers' WCC wage portion should be based on their monthly calorie consumption and not for example on the calorie usage for doing their working tasks.

during work, especially for white collar workers who need to do more brain work and less really calorie consuming physical work (less than the blue collar workers).

- We *could* use other forms and colors for the Cal-Money design, i.e. square or oval form for WCC bank notes & WCC coins, food & energy-specific colors etc.

Now if we consider those points above, I am quite sure that the newly introduced parallel currency, the World Calorie Currency or Cal-Money could be really useful for reducing the severe damages a big currency crisis - like the current ruble crisis - could cause for that country's economy and the rest of the world (e.g. high inflation). Besides, the WCC introduction could support the real economy sectors, particularly the food and energy branch: After all and despite all these new technological progresses in recent years, everybody still needs basic food, energy and calories to survive. And the WCC may even help those overweight people - no matter whether they are men or women - to control their weight and keep their body shape in form, this argument along should be enough to persuade everyone in the world to use the Calorie Currency!

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