

On Velocity in Several Complementary Currencies

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Keywords: Velocity, WIR, Berkshares, RES, Chiemgauer, Sol Violette, Talente, Bristol Pound, Palmas

Abstract: We analyse the velocity of several complementary currencies, notably the WIR, with RES, Chiemgauer, Sol, Berkshares dollars, and several other cases. Then, we describe the diversity in their velocities, and potential explanations for that. For example, WIR velocity is 2.6 while RES velocity is 1.9. Despite being similar currencies, the difference is in WIR blended loans among other benefits. A hypothesis on how velocity is increased, apart from prevailing demurrage approaches, will be described using the comparative method among cases.

Introduction

For the principal author of this study (Josep Lluís), although I've been working with virtual currencies for social networks and intelligent agents since 2006 and published a paper in the IJCCR [Carrillo et al., 2007], this is a first contribution in studies of velocities to the community of complementary currencies in the main stream of this new research area. This was done from a perspective of an academic in IT; i.e., a novice practitioner in complementary currencies. So I'm approaching the subject of the velocities from a naïve perspective of a practitioner, and I am eager to understand the success factors for the deployment of a new currency from the perspective of the velocity. I'm narrowing the focus of the study to velocity for the sake of simplicity. As a scientist, I'm used to divide the problem into more simple questions and try to answer them to reach in the end to a global understanding of the problem. This comparative study on velocities of several currencies, gathers data from several interviews and studies, and then tries to figure out what features might have contributed to the higher velocities. I'm aware that focusing only on velocities does not guarantee the success of the currency, but gives interesting signs of what to expect from a currency if it scales up in size or scope. And for me in particular, involved in the deployment of RES in Catalonia, this focuses on what worries me: what if after all the investment the Catalonian community is not sustainable? The fact is that creating a network is a balance of investment into the community and the benefit/utility that the community perceives. The velocity is for me a clear sign that the currency is useful and an encouraging indicator to go on investing in its growth. That's my motivation.

The paper in section 1 is an introduction to the concepts behind velocity and data on the velocity on the states with the complementary currencies being object of this study; section 2 explains the data gathered from the mentioned complementary currencies; section 3 dissects their features; and section 4 makes the suggestions of the killer features for higher velocities.

1. Velocity

Velocity of money is the rate at which money circulates, changes hands, or turns over in an economy in a given period. Higher velocity means the same quantity of money is used for a greater number of transactions and is related to the demand for money. It is measured as the ratio of GDP (Gross Domestic Product) to the given stock of money. It is also called velocity of circulation. From the Wikipedia "Velocity has to do with the amount of economic activity

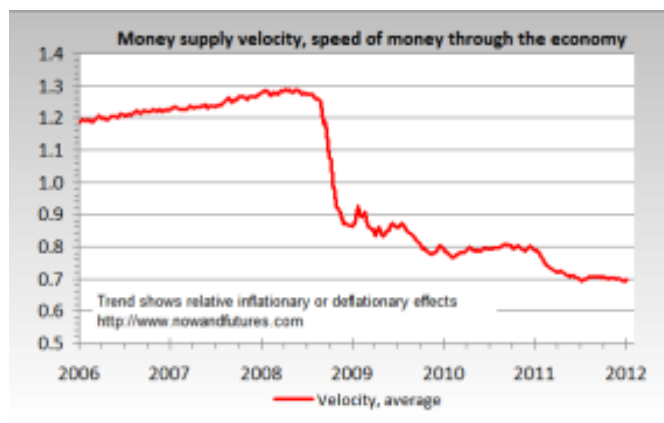
associated with a given money supply. When the period is understood, the velocity may be presented as a pure number; otherwise it should be given as a pure number over time.”

The velocity of money is “simply” “nominal” or current GDP divided by money in circulation. This is seen in the ‘quantity of money equation’, which is an identity, or true by definition: $M*V \equiv P*Y$, where M is the Money Supply, V is Velocity, P is the Price Level, and Y is price-adjusted or ‘real’ GDP. Thus $V \equiv P*Y/M$, GDP at current prices divided by the Money Supply M.

Let us explain velocity with a toy example: A farmer and a mechanic, with just 500 Euro between them, buy goods and services from each other in three transactions this year. The farmer spends 400 Euro on tractor repair and 100 Euro of barn bolts from the mechanic and the mechanic buys 500 Euro of nuts and almonds from the farmer. Then 1,000 Euro changed hands in a year, when there were only 500 Euro in this tiny economy. That 1,000 Euro level is possible because each euro was spent on goods and services an average of twice a year, which means that the velocity was 2 a year. Note that if the farmer made the nuts and almonds a gift to the mechanic, it would not go into the numerator of velocity because that transaction would not be part of this toy example of a tiny economy's gross domestic product.

The more GDP per volume of money, the faster money circulates. During booms, people become optimistic and money tends to circulate with greater velocity, while in depressions, everyone cherishes it and it circulates more slowly. Speed is an indicator of the demand for money, of how people prefer to spend or retain money. Since GDP is average cash balances times velocity, the demand for these balances will be inversely related to velocity. Stodder and Lietaer [2012] show that velocity is always higher for Registered Clients (as compared to Non-Registered clients, usually large companies). Stodder and Lietaer argue that the countercyclical WIR Turnover for Registered firms is driven by changes in Velocity. This definition of national money supply and velocity may also be applied to special purpose moneys, such as the Swiss WIR. Thus Stodder [2012] computes WIR velocity as annual Turnover, or value of all transactions carried out in WRI, as divided by total WIR balances.

Figure 1 – Velocity of the world wide economy <http://realcurrencies.wordpress.com/2012/07/02/the-power-of-demurrage-the-worgl-phenomenon/>



The Lietaer’s Equation Exchange formula for dual-currency systems is $E = (Q_s * V_s) + (Q_c * V_c)$. In periods of crisis $V_s \downarrow$ but $V_c \uparrow$ therefore a countercyclical effect. This is what Stodder and Lietaer 2012 found out.

Maybe it is also worth explaining that in credit crunches $Q_s \downarrow$ (stock of money supply \downarrow as loans are paid off and no new loans are granted), and that credits granted on Complementary Currencies (CCs) can make $Q_c \uparrow$. However, in the beginning of a crisis the most important factors are sending market signals that a) business will have profits so that they’re not afraid of investing, b) consumers will have employment so that they need not be afraid and start saving, and c) prices will not fall, so that investors and consumers need not postpone expenditure

decisions. Increasing the money supply, is not only for increasing Q, but also and most importantly is a market signal to psychologically convince investors and consumers that there'll be liquidity in circulation and that they need not slow down expenditures. So it is more an issue of velocity of circulation rather than of stock of money supply.

Today, there is no exact way to determine the right size of the money supply. Assuming that Velocity is constant, it needs to grow each year by at least the growth in the size of real GDP, or deflation will appear, by definition. If money supply grows more than this, on the other hand, one has inflation.

Money supply data are recorded and published principally by the government or the central banks of the countries. The European Central Bank's definition of euro area monetary aggregates¹ are:

M1: Currency in circulation + overnight deposits (+ travelers checks and other checkable deposits, in the USA)

M2: M1 + deposits with an agreed maturity up to 2 years + deposits redeemable at a period of notice up to 3 months (in the USA, M2: M1 + most savings accounts, money market accounts, retail money market mutual funds, and small denomination time deposits (certificates of deposit of under \$100,000).

M3: M2 + repurchase agreements + money market fund (MMF) shares/units + debt securities up to 2 years

In practice, for most countries the M2 or M3 definition of the money supply is the most representative. M2 is most often used to compare velocities of worldwide currencies. As well, for the sake of simplicity, and because Complementary Currencies (CCs) have no sophisticated mechanisms for the money supply apart from commercial loans and money-in, we will compare the velocity of the CC only with the velocity calculated with GDP / M2 of their respective countries.

Velocity of the dollar in the US² 2012 is 1.537, down from 1.597 one year ago in 2011. A study³ claims it is at its low. The very low circulation of the US dollar you point out is probably due to its use as the major reserve currency in the world, both for central banks and for private individuals living outside the US. A recent Federal Reserve study⁴ estimates that about half of all US currency and about 65% of US \$100 bills are held outside the US (p. 12): This 'outside' US currency is a) mainly a store of value, not a means of exchange, and b) when it is exchanged, it is often for things outside the US, that do not add to US GDP. Thus, its outside use can be expected to contribute to a low velocity.

The velocity of the Swiss franc⁵ in 2010 is of 2.9.

The velocity of the Brazilian Real⁶ in 2009 is of 2.7

¹ The ECB's definition of euro area monetary aggregates:

<http://www.ecb.int/stats/money/aggregates/aggr/html/hist.en.html>

² http://ycharts.com/indicators/velocity_of_m2_money_stock

³ <http://seekingalpha.com/article/958031-u-s-money-velocity-at-historic-low>

⁴ <http://www.federalreserve.gov/pubs/ifdp/2012/1058/ifdp1058.pdf> This same study also finds (p. 10) that the proportion held abroad is growing as the dollar's role as a reserve currency strengthens, and that this is contrary to the trend of other currencies, where greater use of electronic (cashless) payments can be expected to increase velocity. Note in Figures 3 and 4 (p. 36) that the ratio of Currency to Nominal GDP (the inverse of the Velocity for Currency) has been rising for the US (especially for large denomination bills, and with a sharp uptick since the 2008 global financial crisis). For the Canadian currency, by contrast, this ratio has been relatively stable over the long term, with a gradual decline in the ratio for all currency (and no clear uptick in 2008). Thus the velocity of US currency has been falling, while that of Canadian currency has been rising.

⁵ https://editorialexpress.com/cgi-bin/conference/download.cgi?db_name=MMF2012&paper_id=88

⁶ Boletim do Banco Central do Brasil, <http://www.bcb.gov.br/?BULLETINCR>

The velocity of the UK Pound Sterling is of 4.1 in 2010 according to [Mallet and Keen, 2012: Figure 5]

Using the report of trading economies ⁷ we calculated the velocity in 2011 of the Euro in the German territories is of 2.77

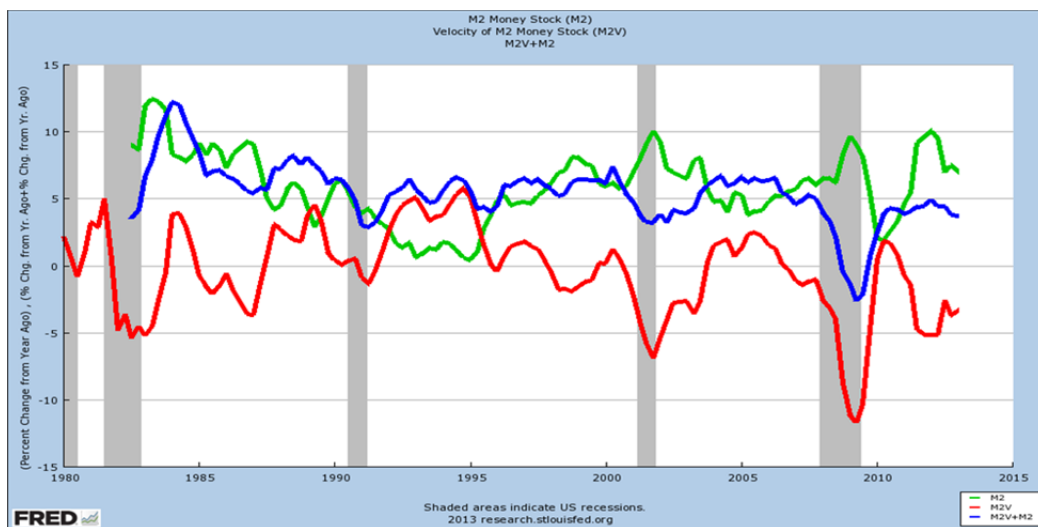
The following velocities are estimates from old papers: The velocity of the French Franc is 1.9 as of 1984 according to [Blundel-Wignall et al., 1984]. The velocity of the Spanish pesetas was 1.4 as of 2000 according to [Carreras et al., 2006]. Our estimate of the velocity of Euros in Belgium should be between that of France and Germany at 2.5, and the estimate of the Austrian velocity should be between that of the German and Swiss velocities at 2.83. These are guesses in need of updates, and such will be provided in future versions of papers out of this research, but they will serve for the purpose of this paper.

Table 1 – Velocities of the national currencies of several countries

Country	Velocity	Year
USA	1.6	2011
Germany	2.8	2011
Switzerland	2.9	2010
UK	4.1	2010
Brazil	2.7	2009
France	2.4	2012
	1.9	1984
Spain	1.4	2000
Austria	2.8	Estimate
Belgium	2.5	Estimate

Central banks both in the EU, UK, and the USA have created a lot of money in the current worldwide recession. The so-called monetary base, consisting of cash and the central banks' deposits, has more than tripled in the US ⁸, and only increased by about 50% in the UK since 2007⁹. The increase of M2 in the USA is shown in the following Figure 2; showing continuous growth of M2 (with positive derivative all years) while velocity trend in the recent years from 2007 tend to be negative.

Figure 2 – Rates of M2 and M2 Velocity (M2V) of the US economy



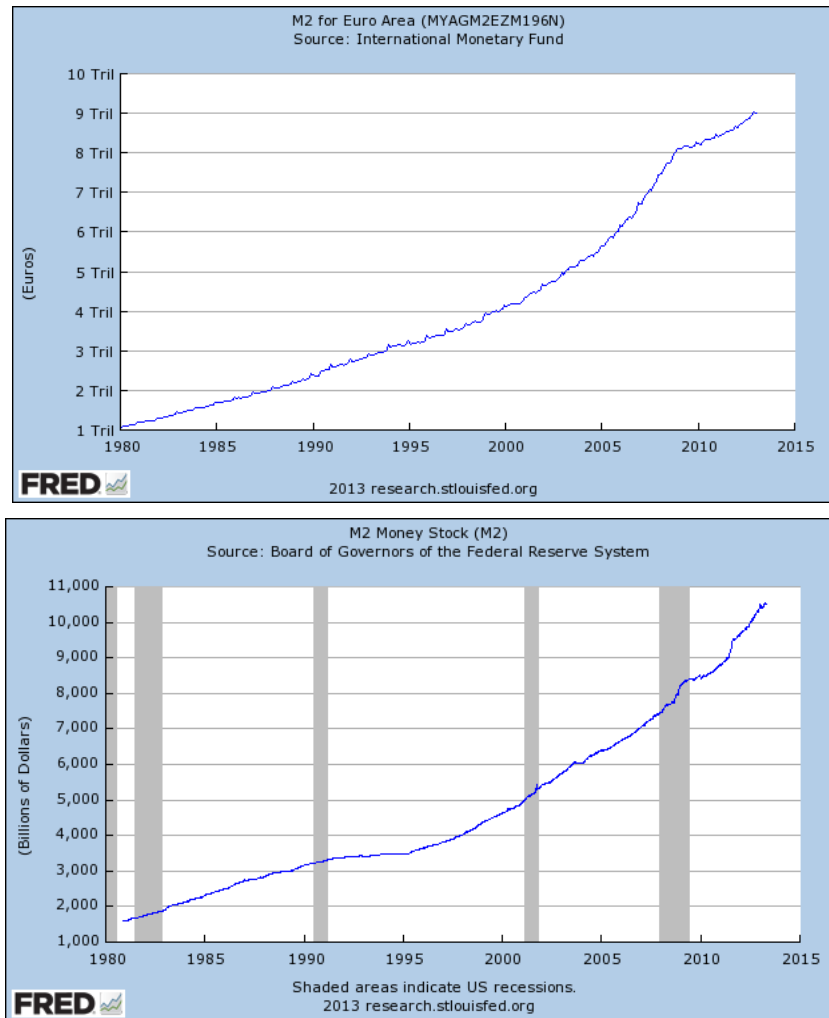
⁷ <http://www.tradingeconomics.com/country-list/money-supply-m2>

⁸ <http://research.stlouisfed.org/fred2/series/AMBSL>

⁹ <http://www.bankofengland.co.uk/boeapps/iadb/fromshowcolumns.asp?Travel=NixSTxTAXSUx&FromSeries=1&ToSeries=50&DAT=RNG&FD=1&FM=Jan&FY=2006&TD=14&TM=Apr&TY=2013&VFD=Y&html.x=10&html.y=18&CSVF=TT&C=VU&Filter=N>

Note that even though M2 Money supply (green line) increased during the 2008-2009 US recession (shown as shaded vertical bar), the Velocity (red line) decreased over the same period to the point where total Turnover (blue line) decreased.

Figure 3 – The M2 money supply of Euroland and USA, always growing in the last decades (images from research.stlouisfed.org/fred2/series/M2; research.stlouisfed.org/fred2/series/MYAGM2EZM196N)



However, shrinking private bank credit in the lending freeze brought about by the credit crunch has continued longer than expected has offset this. As a result, growth in total money the world over has been slow. This means that most of the money ‘created’ by quantitative easing is sitting in banks’ reserves, rather than finding its way to businesses and consumers. This is shown by the ratio of official Bank Reserves in the US ¹⁰ to its M1 ¹¹, which is currently about 75%. Before 2008, it was at most 2 or 3%. This is logic since new regulations worldwide have increased capital reserves requirements. Moreover, when quantitative easing reached businesses, it tended to be large companies rather than SMEs, therefore a recent recovery of stock markets rather than in employment rates (SMEs tend to be more labour-intensive, and tend to have less access to capital markets).

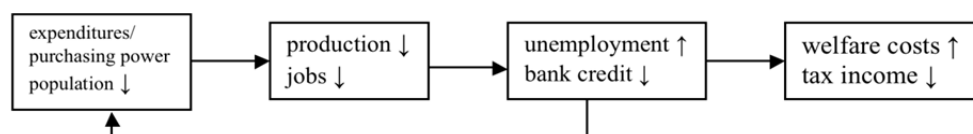
Despite of the growth of M2, this crisis has seen a credit crunch / fall in lending. If velocity of circulation is stable then this will lead to a fall in the nominal value of GDP. As can easily be seen from the quantity of money equation, matters are made worse if Velocity is also declining

¹⁰ <http://research.stlouisfed.org/fred2/series/WRESBAL>

¹¹ <http://research.stlouisfed.org/fred2/series/M1SL>

– households are starting to hoard cash as are companies worried about insolvency, the lack of credit, and hedge funds holding onto cash because of fears over investors wanting to redeem their money.

Figure 4 – Arkel and Ramada (2011 unpublished) C3 for Ireland.



More velocity of circulation is more expenditures and purchasing power (your spending is my income, my spending is your income), therefore more production and employment.

In the following sections we will show several CCs in those countries (USA, Europe, Switzerland, and Brazil), and we will see their velocities compared to their national currencies velocities as well. As most of the CCs have near parity with their official national currencies, that is $1 \text{ CC} \approx 1 \text{ EUR/USD/CHF/REA}$, we think it is highly significant when a CC shows higher velocity than its official national currency. The question is: what does higher velocity in a CC represent? According to [Stodder and Lietaer, 2012] the countercyclical turnover of WIR Registered firms is driven by changes in Velocity. Thus, velocity of the CC might be impacted by the velocity of the official national currency: it might be countercyclical (as proved for the case of WIR), and it could be faster or slower, giving signs of its usage and utility. Again Lietaer's Equation Exchange Formula for dual-currency systems would be helpful to explain this

Falling velocity is a result of an increased demand to hold money as opposed to a desire to expand productive capacity or borrow to make purchases. As well, falling velocity might occur if banks do not want to lend and consumers and/or businesses do not want to borrow. The Central Bank can print, but it cannot determine where the money goes, or indeed if it goes anywhere at all. This is called "pushing on a string"

To counter the effects of falling velocity, one the principles of CCs is to provide money (liquidity) in an alternative to the national currency to encourage new transactions. Velocity is then a measure (although not the only one) of its utility and fulfilment. Velocity of money can be understood as the efficiency of money in generating economic activity (GDP). That is, with a given money supply, more velocity of circulation reflects more efficiency of each unit of money in generating GDP. But the current monetary system is procyclical, as velocity slows down in periods of recession. However, it is in periods of recession when increasing velocity (efficiency of) money is needed the most. So increasing velocity is a way to counteract a recession. We focus on the velocities to compare the currencies and then try to grasp why they are different. This is the narrow scope of this paper.

2. The Currencies Compared in this Study

The complementary currencies (CC) that are object of this study are: the WIR in Switzerland, the RES in Belgium, the Chiemgauer in Germany, the Talente in Austria, the Sol-Violette in France, the Bristol Pound in UK, the RES in Catalonia, the Berkshares in the USA, and the Palmas in Brazil. The velocities are calculated according to papers on the state of the art or by interviews we made by visiting the staffers of the currencies. A set of the profile of the currencies can be found in [Rogers, 2012].

WIR, Switzerland. The robust annual turnover of the top complementary currency in the world, the Swiss WIR - Wirtschaftsring-Genossenschaft or Swiss Economic Circle) owes much to the business model of the dual WIR Bank that offers blended loans, based on the WIR and Swiss francs. For if, as a rule, the WIR and the Swiss Franc economies do not bloom at the

same time, the growth of one can compensate for the stagnation in the other, as shown in [Stodder, 2009]. As shown in its WIR 2012 yearly report, results¹² is well established CHF/CHW 4.01 billion (with a 3.3% in all increase from 2011) but WIR participants generated turnover of 1.46 billion CHW in 2012, equivalent to a decrease of 6.0% compared to the previous year. This decrease resulted primarily from a domestic economy that was healthy and well stocked, as well as loan availability in Swiss francs at very low interest rates. The difference with the traditional WIR credit, granted on favourable terms - the real engine of the WIR system - can be understood from this perspective.

Its velocity is 2.6 according to [Stodder and Lietaer, 2012].

Talente, Austria. This is an exchange ring plus circulating currency, i.e., a physical scrip, not just electronic credits and debits, a la the WIR. It is also named Z(w)EITgeld that means the “second money”, situated in Vorarlberg in Austria, bounded on three sides by other countries (Liechtenstein, Switzerland, and Germany), born in 1996 with 758 members that traded 293,000 Talentes in 2011. www.talentierte.at

The velocity of the Talente is 4 according to [Godshalk, 2011]

RES, Belgium. This is a business exchange network, similar to WIR but without blended loans or a dual RES Bank. Born in 1995, over 5000 members and 100,000 consumers trade over 31 million RES a year, being 1 RES = 1 EUR. RES added business to consumer loyalty system and consumer to consumer transactions in 2003 but the core business remains business to business. www.res.be

Its velocity is 1.9.

Berkshares, USA. Born in 2006, it is a loyalty scheme based on circulating money for the support of the local economy. 400 businesses accept the Berkshares, with a turnover of 512,472 Berkshares in 2011. 1 Berkshare = 0.95 USD. www.berkshares.org

Its velocity is 4.1

Chiemgauer, Germany. This is a circulating currency founded in 2003 in the Chiemsee, Bavary, Germany for the support of the local economy. The currency, 1 Chiemgauer = 1 EUR is Local fiat backed by Euros, with a demurrage¹³ fee of 2% per quarter, electronic money compliant and microcredit loans. Its nearly 600 members traded 6,198,411 Chiemgauers in 2011. www.chiemgauer.info

Its velocity is of 11.3 according to [Yasuyuki, 2012]

Sol-Violette, France. This is a circulating currency as well, founded in 2011, serving the region of Toulouse in France. With 40.000 Sol ecos issued since 2011, it serves 80 businesses and 700 consumers. It uses as well a sliding demurrage fee of 2% per quarter as well as Chiemgauer. www.sol-violette.fr

Its velocity according to its 2012 yearly report¹⁴ is of 4.49

¹² http://www.wir.ch/fileadmin/user_upload/geschaeftsberichte/gb_2012_WIR_Bank_fr.pdf consulted as of April 10, 2013

¹³ Silvio Gesell, the German-Argentine economist whose ideas inspired the founding of the WIR-Bank and Chiemgauer, had decades of international trade experience in Buenos Aires. Gesell's use of the term demurrage was borrowed directly from international shipping, where it denotes a reduction in payment to compensate for an unscheduled delay in the delivery of goods. Gesell applied a demurrage charge to the holding of money, with the aim of increasing its velocity. WIR-Bank originally applied such a charge, but eliminated it in 1948 (Stodder, 2009).

¹⁴ Pour une réappropriation citoyenne de la monnaie, Le Sol-Violette, Bilan 2012, http://www.folieseconomiesolidaire.org/IMG/pdf/Bilan_2012_-_Le_Sol-

Palmas, Brazil. This is a circulating currency, launched in 2003 (after the Bank of Palmas creation in 1998), that support the local economy, and microcredit loans in both national and local currency. www.bancopalmas.org.br

Its velocity (estimated out of [Rogers, 2012]) is of 13.5

And there are included in the study two new currencies that started the late 2012 that are also included in the study because of their immediate impact of Bristol Pound, or being of interest as a replication of existing currency like RES.

Bristol Pound, UK. This is a new currency in Bristol, UK, that started on September 2012 devoted to local business development as a loyalty scheme based on circulating currency and virtual currency, and mobile payments. It serving 500 business that accept the Bristol Pound notes (259 of them accept the virtual currency) and over 160,000 Bristol Pounds are supplied. www.bristolpound.org

Its velocity is of 0.8. (Final calculations yet to be done with final data on June 2013).

RES, Catalonia. This is the RES currency started in a new country on October 2012, in Catalonia, in the kingdom of Spain. Being a unique system within RES, its approach is closer to Bristol Pound and Berkshire than the WIR-like system, so that it is worthy of study as a new case of a community currency. It serves 250 members and has supplied 43,441 RES into circulation. www.res.cat

Its velocity is of 1.56

The table of velocities of the complementary currencies compared to the velocities of the currencies of their countries and further features are the following Tables 2 and 3, ordered from the biggest monetary mass to the smallest with data harmonized to 2011 with the exception of the two new currencies that are using data from April 2013. There are some currencies that run at higher velocities compared to their national counterpart.

Table 2- The 9 complementary currencies under study, ordered by monetary mass

	National				Monetary Mass	Turnover per member/year	Turnover/year	Num. of biz	Charge % /transaction
	Velocity	velocity	Ratio	Qual					
WIR	2.60	2.90	0.90	Fair	596,153,846	19,375	1,550,000,000	80,000	3.5%
RES	1.89	2.59	0.73	Fair	16,763,188	7,562	31,758,340	4,200	7.0%
Talente	4.00	2.84	1.41	Fair	729,575	3,850	2,918,300	758	0.0%
Chiemgauer*	11.30	2.77	4.08	VeryHigh	550,442	10,453	6,198,411	598	5.0%
New! Bristol Pound	0.79	4.10	0.19	Low	163,600	501	129,836	259	0.0%
Berkshares	4.05	1.60	2.53	High	126,399	1,281	512,472	400	5.0%
Palmas**	13.50	2.70	5.00	VeryHigh	46,000	3,765	1,016,600	270	2-15%
New! RES Catalonia	1.56	1.40	1.12	Fair	43,441	272	67,890	250	7.0%
Sol Violette	4.49	2.40	1.87	High	33,403	1,579	150,000	95	NA

Table 3 – Date of the measures and further features

	Velocity	Turnover/year	Date of Measure	Key Features
WIR	2.60	1,550,000,000	2011	Blended loans. Impact of 1.02% of Swiss GDP accounting blended loans
RES	1.89	31,758,340	2011	WIR-like
Talente	4.00	2,918,300	2011	Local taxes accepted in T alentes. It is supported by yearly member fees
Chiemgauer*	11.30	6,198,411	2011	Demurrage and 3% of consumer money-in is devoted to solidarity projects and blended loans
New! Bristol Pound	0.79	129,836	2013***	Local currency. Wide awareness. Local taxes accepted. Major payroll is in Bristol Pounds
Berkshares	4.05	512,472	2012	Loyalty scheme for Berkshire County, Massachussets
Palmas**	13.50	1,016,600	2011	Blended microloans and 5-20% salaries of public bodies are paid in palmas
New! RES Catalonia	1.56	67,890	2013***	RES-like with consumer focus.
Sol Violette	4.49	150,000	2012	Loans and grants in sols and demurrage

* 4.97 times faster than the Euro in Germany (which velocity is of 2.27 in 2011 calculated by GDP/M2)

** five times faster than the Réais of Brésil (what is the velocity of Réais? Estimate of 2.7 in 2009)

*** 6 months analysis from Oct 2012 of Bristol Pound and 5 months from Nov 2012 of RES Catalonia. Final data from Bristol Pound are pending

From these tables we can see a variety of behaviours. In the following section 3 we will further dissect the properties of the currencies and we will compare groups of currencies among each other, by taking into account the relative velocities and the ratio of their velocity compared their national currencies in their specific regions or nations (in the case of Euro) to have a more clear idea if some features give a real boost to the economy.

We consider a velocity as “fair” if it is equal to the velocity of the national currency in the main region or state of that CC, plus or minus 20% threshold, as a low velocity if it falls under that threshold, and a high velocity if it goes higher than that the threshold. In the case of going higher by a factor of 3 or more, we consider it a very high velocity.

Thus, Palmas run at very high velocity, Chiemgauer runs at high velocity, the Bristol Pound at a low velocity, while the remaining currencies run at fair velocity.

The method to take conclusions is twofold: compare the currencies first (Section 3) from the point of view of every feature (blended Loans, demurrage, etc.), and then in Section 4 compare the peer currencies and groups of currencies (Section 4).

3. Dissecting the Complementary Currencies

The features we are going to compare the CC are:

- Commissions on transactions, sign up, renewal fees, and so on.
- Whether they are offering blended loans.
- Virtual currency or scrip or combined
- Whether the CC is convertible to a national currency (Dollar, Euro, Swiss Franc, Réai)
- Whether demurrage is applied.
- Whether the CC is backed by a national currency and whether consumers can buy it.
- Others.

It seems that having **blended loans** (loans in national and complementary currencies) like the cases of WIR, Chiemgauer, and Palmas has a positive influence on velocity. **Microloans** are offered by Palmas and presumably by Chiemgauer, and this might contribute to the highest velocity (see Table 4).

Being inclusive with several types of non-members participation, like the **non-registered** members of WIR or the **consumers** (prosumers) of Chiemgauer, Palmas or Sol-Violette can boost velocity as well.

Being **virtual money** does not seem to increase he velocity. WIR and RES are purely virtual and are much slower than the partly virtual Chiemgauer, while the partly virtual Bristol Pounds do

not show yet signs of high velocity. On the other hand, the partly virtual Palmas, Sol-Violette, or the scrip portions of Chiemgauer and Bristol Pounds show vigorous velocity. On the other hand, **scrip money** might increase velocity as Berkshares, Chiemgauer, Talente, Bershares, Sol-Violette and Palmas all have notes and as a group have higher velocity than the purely virtual WIR and RES currencies.

Higher commissions might reduce the velocity like the case of RES with the 7% that leads to lower turnover member/year compared to WIR and Chiemgauer. Yet the 3.5% commission of WIR does not lead to the highest velocity compared to Chiemgauer with its 5% commission per transaction and a velocity that is 4 times higher than the WIR.

It might also be that those CC **convertible to national currency**, even at a loss of 5% to 15% like Berkshares, Talente or Chiemgauer have thereby kept their very high velocities.

The very high velocity Chiemgauer is also distinguished by the **3% of Chiemgauer purchases earned in EUR being devoted to social affairs**, to a community group of their choice.

It is also distinctive in the case of high velocity Palmas and Chiemgauer, that the staffers are paid a **percentage of their wages in the CC**.

Let us talk about the case of the **demurrage**, that was designed specifically for speeding up transactions. It is implemented to the cashless Chiemgauer accounts with a fee of 0.02% per day (with a negative-interest-free period of 90 days) as well as the scrip and 2% demurrage every 3 months of the Sol-Violette. We might note here that boosting velocity was always the explicit purpose of demurrage, since it imposes an explicit cost on holding money. See [Stodder 2009; footnote 4, page 4]. The only ones applying demurrage like Chiemgauer and Sol-Violette might have positive influence in the velocity as well if compared to their peer currencies like Talente for Chiemgauer or the new currencies of Bristol or RES Catalonia to Sol-Violette.

The reasons behind demurrage are safeguarding and stimulation of the money circulation in order to generate more local business: “Money that never slows down circulation”; “The advantage is that everybody keeps money going”; “The velocity of money or the speed of money is faster.” Demurrage or other ways to safeguard the circulation is promoted by the German Regiogeld-Association. Every initiative, supported by members of the association, is committed to quality. One of the initiatives is: To support a sustainable financial system by determining and controlling the amount and velocity of the money issued.

From the point of view of the Chiemgauer, the following considerations come up : Chiemgauer is not only backed by euros but also by powerful ideas and deep personal commitment, deeply inspired from the ideas of Christian Gelleri, where the need for concrete, grassroots projects growing organically through the creativity of individuals and groups. They have to be useful for the participants and they have to be both idealistic and pragmatic. The economy is like a dynamic bloodstream that means that if money does not flow then the economy is in pain. The first aim was to bind the money and let it flow within the community. Binding purchasing power as marketing experts would say. Other objectives were to foster co-operation, strengthen the local economy, increase sponsorship for non-profits, reduce food transport, reduce money speculation and increase regional investments.

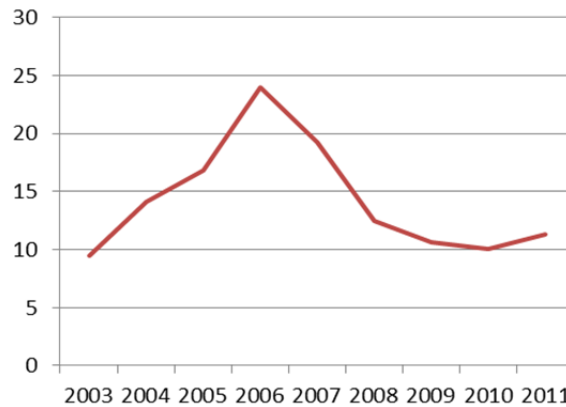
The velocity of the Chiemgauer¹⁵ (is estimated at 11.3. It is very fast velocity compared to the other CC of this study, and is 2.55 faster than the Euro [Yasuyuki, 2012], even with a relatively small turnover per member of 10,453 Chiemgauers per member and year compared to WIR.

¹⁵ See Chiemgauer-Statistik 2003-2009 of Chiemgauer e.V. made by Christian Gelleri. The velocity of the cashless Chiemgauer could be measured exactly whereas the velocity of the paper money is estimated based on surveys at acceptance points. The velocity of the Chiemgauer is calculated as yearly sales turnover divided by the average outstanding money stock.

Demurrage seems to be key to this high velocity. Its velocity is showing to be much higher than the velocity of conventional money, which is approx. 2.77 in the German area of the Euro.

The Chiemgauer is the second best documented currency (after WIR, perhaps), and we see its velocity skyrocketed to 20 in 2006 while now is stable around 11 (see Figure 5). It seems the introduction of the virtual currency in 2004 increased the velocity but its effect got diluted along the years coming back to nearly the same velocity of pure scrip based transactions in 2003. As size matters, it also seems that the continuous growth of the number of members and transactions of the Chiemgauer has reduced the velocity, yet to a level that is unbeatable by the peer currencies

Figure 5 – The velocity of Chiemgauer along 2003-2011



With demurrage, money expires, that seems it has the advantage that everybody keeps money moving. But the very same idea for RES (and presumably WIR) members might seem highly unacceptable. Today, strong positions against and in favour of the demurrage are happening.

These features and more are compared in the following table 4. The columns are grouped by the following groups: Approach and mission, the supports for running the CC, the business model behind, the inherent features of the CC, and a final group of others that tell us other framework factors like awareness, whether people forget about the currency once they start trading each other or the relative volume of transactions.

Table 4 – Comparing the features of the several CC

Velocity Currencies	Approach - mission					Supports				Business Model		Features of the CC							Others				
	Mutual Credit for Purchase	Blended loans	Fiat currency-backed of (part of) the CC	Loyalty Scheme (B2C prevails over B2B)	Income partly goes to social actions	Staff paid in CC	Professional Management (local) bank or union participation	With the support of public grants of public bodies or donors	Commissions	Membership (annual) fees	Sign up for new members	(Local) taxes accepted in CC	Grants or prizes in CC	Demurrage	Script (paper, notes)	Virtual	Mobile / Smartphone payments	Convertible back to fiat currency	People forget the CC after knowing each other and they shift to trade in fiat currency	Wide Awareness	Size (number of members and volume of transactions)	Currency	
1.6 RES Catalonia	yes	no	yes	yes	no	yes (10%)	yes	no	no	7.0%	yes	no	no	no	no	yes	no	no	NA	no	very small	RES Catalonia	
1.6 Bristol Pound*	no	no	yes	yes	no	not paid	no	yes, credit union	yes, donors	0.0%	no	no	yes	no	no	yes	yes	partly (virtual is)	NA	yes	very small	Bristol Pound*	
1.9 RES	yes	no	no*	no	no	yes (10%)	yes	no	no	7.0%	yes	yes	no	no	no	yes	no	no	perhaps	no	very big	RES	
2.6 WIR	yes	yes	no	no	no	NA	yes	it is a bank	no	3.0%	yes	NA	no	no	no	yes	no	no	NA	yes	huge	WIR	
4.1 Berkshares	no	no	yes	yes	no	not paid	no	yes, local bank	yes, donors	5.0%	no	yes	no	no	yes	no	no	yes (5-10% loss)	yes	no	small	Berkshares	
4.5 Sol Violette	no	no	yes	no	yes	NA	partly	yes	yes, city	NA	yes	NA	yes	yes	yes	yes	NA	no	yes (5% loss)	yes	no	very small	Sol Violette
5.3 Talente	yes	no	yes	yes	no	yes (50%)	no	no	no	0.0%	yes	yes	yes	yes	yes	yes	yes	no	yes (15% loss)	yes	no	big	Talente
11.3 Chiemgauer	no	no	yes	balanced	yes	yes (50%-100%)	yes	yes	no	5.0%	yes	yes	NA	yes	yes	yes	yes	no	yes	no	no	big	Chiemgauer
13.5 Palmas	no	yes	no	no	no	yes (20%)	yes	it is a bank	no	2-15%	no	no	yes	no	yes	NA	no	no	NA	no	small	Palmas	

NA - Data about it Not Available

* pilot group with few hundreds of consumers from 2011

** = needs verification

As a curiosity, in [Godschalk, 2011], there are reported the velocity of three scrip currencies in the USA, with incredibly high velocities from 60!! See the following Table 5 - The evaluation of velocity is possible for the stamp scrip issued during the Great Depression in Santa Cruz (California), Okmulgee (Oklahoma), Mason City (Iowa) and Carmel (California) in the USA.

Table 5 – Velocities of stamps scrip of several CC in the 30s [Godschalk, 2011]

Location	Santa Cruz	Okmulgee	Mason City	Carmel
State	California	Oklahoma	Iowa	California
Type of stamp scrip	tx-based	tx-based	hybrid	tx-based
Total issuance (No. Of 1-Dollar-notes)	1,050	3,000	10,000	1,200
No. Of samples	76	66	44	21
Samples in \$ of total	7.20%	2.20%	0.40%	1.80%
First day of issuance	April 11, 1933	Feb 1, 1933	May 6, 1933	Feb 2, 1933
Last day of issuance	June 10, 1933	Apr 1933	July 1, 1933	July 28, 1933
Total stamps needed	50	35	52	36
Transaction fee (USD Cents)	2	3	2	3
Av. No. Of Transactions	48.7	32.5	52	32.6
Av. No. Of days of circulation	365.9	204.6	320.1	229.8
Av. Sales turnover per year (USD) = Velocity	51.8	97.1	60.6	56.6

Quoting Godschalk, the scrip issued in Mason City was hybrid (time- and transaction-based). Analysing its velocity the results are comparable to the transaction-based only scrip issuances. Although the transaction tax was 50% higher (3 ct. compared to 2 ct.) the velocity of the Okmulgee scrip accelerated to almost 100 almost twice as high as Santa Cruz or Mason City. During the Great Depression the velocity of the dollar (in Godschalk's paper this is calculated with M1) decreased dramatically from 3.42 (1929) to 2.19 (1933). A velocity of transaction-based scrip of 50 or even more indicates that this kind of local scrip worked very well in these areas compared to the striking conventional money during this crisis. There are no hard facts available about other local scrip.

This fact makes me wonder about the decisive contribution of consumers to speed up the velocity of the currency between businesses or simply it is because scrips run smooth in deep crisis. Let us analyse the cases of Bristol Pound and RES.cat, a branch of RES in Catalonia, where the departing model was B2C. In the first 5 months of its existence from November 2012 to March 2013 there were 67,890 RES in sales, with a velocity of 1.56 out of a money supply from consumers of 35,479 RES that represent the 81.7% of the total of the monetary mass. This means that consumers contribute with velocity at least of 1, but then merchant and businesses need to activate their mutual purchases to reach the full, higher velocity.

Table 6 – The case of RES Catalonia, and its analysis of the money supply, sales, and velocity

	2012		2013			TOTAL	
	November	December	January	February	March		
Num. of transactions	1,362	1,400	1,455	1,649	1,106	6,972	
Sales	10,894	16,789	13,462	12,261	14,485	67,890	
Acc. Sales	10,894	27,683	41,145	53,406	67,890		
B2C money-in EUR	3,410	6,850	1,511	5,440	2,260	19,471	
B2C money-in RES	6,342	12,256	2,132	11,212	3,538	35,479	81.7%
B2B money-in RES	1,510	1,414	1,767	3,270	0	7,962	18.3%
Total money supply RES	7,852	21,522	25,421	39,903	43,441	43,441	100.0%
Velocity	1.39	1.29	1.62	1.34	1.56	1.56	

Let us see the Bristol Pound with a similar scheme. It is a new UK CC backed entirely by Sterling Pounds with local yet remarkable world-wide awareness, combining scrips and virtual currency, being the online currency belonging to businesses convertible back to Euros, and a bonus of 5% for the first 100.000 Bristol Pounds supply that happened after the first 5 months

of existence. Business voluntary offer discounts I paid with Bristol pounds. Money supply as of March 2013 was 163,600 Bristol pounds as follows: 66,800 BP in notes + 96,800 virtual BP (in online accounts). The payment online (txt2pay) happened with 42,284 BP (10,720.08 Bristol pounds in March only) as well as 15,497.17 BP paid to the council (only virtual payment in total in the six months). There is pending estimates of the payments done online (with online banking) and the estimates of payments with the notes. There are 259 biz accounts (with accounts and over 500 biz in all accepting notes) and 687 individuals from October to March. 5 part time staffers contribute with 2-3 days a week (partly) paid by grants (philanthropy). The BP case, similarly to the RES Catalonia case, faces a strong barrier of merchants in the shift of their behaviours towards buying local, claiming that they lack of (proper, local) providers. In the two cases, it seems that having consumers buying local put pressure on the businesses unless they share the vision of the greater good, working together to cooperate to survive or do better.

In the end, it is not clear at all that having consumers in addition to businesses speeds radically the velocity, yet it might contribute with 1. In any case, it increases the awareness and pressure to adopt the CC, that indirectly will contribute to higher velocity.

4. Suggestions

After the dissection, we decided that peer currencies are divided in three groups: A) Talente Sol-Violette and Chiemgauer, B) Berkshares, Bristol Pound, and RES Catalonia, C) RES, WIR, and Banco Palmas. The categories are A, B, C that roughly reflect different approaches and missions, being A regional, B local, C businesses oriented.

So the qualitative analysis with ensuing suggestions is as follows:

It doesn't seem that commissions restrain the velocity of the CC, because the case of the Chiemgauer and Palmas have over 5% compared with the 3 - 7% of the WIR and RES

It doesn't seem either that yearly maintenance costs restrain the velocity.

Size might matter: the highest velocity is achieved by less than 1,000 members in groups A and B. **Small is beautiful?**

Professional management might help: Chiemgauer outnumbers its peer Talente. On the other hand, there is no evidence that it makes to a difference in the WIR, RES or Palmas. The only possible thing is that it has an effect to the size of the currency: being run by professional staff, WIR, RES, and Chiemgauer are having, ranked from high to low, the highest amount of members and volume of transactions. The causality might run the other way, however – from size to staffing, if only the bigger currencies can afford to hire professionals

Staff is partly paid in CC might help: enhanced trust in the currency, and first class knowledge of its utility. Same case of Chiemgauer and Talente.

Does B2C boost the velocity? Good question, yet it might be true for the case of Chiemgauer and Sol-Violette compared to Talente. Velocity is not too bad with Berkshares, but it is unclear in the early signs of the new born Bristol Pounds and RES Catalonia experiences. Stodder [2012, Table 3] shows that in all industrial and commercial sectors, the velocity of WIR is higher for smaller Registered than for larger Non-Registered clients. He models this as small businesses being more constrained by the scarcity of cash and credit in their national currency, and thus eager to substitute WIR for that currency. This same constraint and resulting velocity is likely to hold for most consumers.

Blended loans help: This seems to be a velocity accelerator, as one sees an increase of 0.7 in the velocity of WIR when compared to RES, and the velocity of Palmas is 1.8 greater than Chiemgauer.

Sense and pride of belonging might help: Chiemgauer devotes 3% of B2C money to social actions.

Support of the City is unclear whether it helps or not. There are a couple of currencies with strong city or regional involvement as the case of Toulouse with Sol-Violette and Bristol with Bristol Pounds. However, for sure it helps the early sustainability of the currency. We might note here that the special status of government-issued currencies (fiat or otherwise) as the sole legitimate means of payment for taxes or fines was crucial to their universal acceptance as money. See for example how “tally sticks” became money in Medieval England, through their payment to the Exchequer¹⁶. This is the case with Talente and Bristol Pounds: local taxes can be paid with the CC.

Support of a Bank: It is unclear whether this helps. Palmas is top for velocity, but WIR is a bank as well and, anyway, its speed is low.

Demurrage: Chiemgauer and Sol-Violette are the only ones with this money property. Chiemgauer is the most reliable case, and it is worthy of consideration that it runs with a higher velocity than its peers, the Talente or Berkshares.

Scrip runs faster than virtual money? It is not clear. It is true that the cases of the purely virtual currencies like WIR and RES show low velocity even compared to the rest of currencies that work with notes only or partly, perhaps with the exception of Chiemgauer.

There might be a final reflection on demurrage as a way to manipulate velocity of circulation (a demurrage on money? or a demurrage on bank reserves aiming to boost lending?). Another option is creation of a double-currency system in which the local currency is demurrage-charged. Maybe also acknowledging that velocity is important for GDP growth, but that GDP growth is not everything (there are many critics to GDP as indicator, since it hides many things...). Maybe highlighting the importance of a high-velocity, low-interest-bearing local currency for the SMEs sector as an employment promotion policy

After all the analysis we have detected possible drivers for higher velocity in complementary currencies, being not only demurrage the only factor boosting the velocity but a proper combination of utility and sense of belonging achieved by useful blended loans, a strong base of B2B members yet consumer involvement, and perhaps the intelligent combination of scrip and virtual money, and yet size might matter in the sense that not too small for having a critical mass but not too big either where the sense of belonging might get diluted. On the other hand, there is no clue that public bodies or bank branches supports encourage higher velocities. Having prosumers or non-registered members (in the case of WIR) seems to boost velocity in it is well leveraged by a healthy network of companies as members.

As said, velocity is not all in a complementary currency, but just a sign of its lively utility and health, and the ground for its sustainability.

Acknowledgements

I want to thank the several reviewers of this paper and especially to Andreu Hozawa of the STRO foundation. This research is partly funded by the Spanish MICINN (Ministerio de Ciencia e Innovación) projects TIN2010-17903 *Comparative approaches to the implementation of intelligent agents in digital*

¹⁶ As recounted in Glyn Davies' *History of Money*, pp. 147-153, http://library.uniteddiversity.coop/Money_and_Economics/A_History_of_Money_From_Ancient_Times_to_the_Present_Day.pdf.

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