

# Providing a New Source of Digital Money to Service the Modern Economy

Submission to the National Payments Plan, Payments & Securities  
Division of the Central Bank of Ireland

by



## Overview:

**Part I** of this document will discuss how developed economies operate in terms of how electronic money is created and deleted. We will look at some side effects of the change from use of currency to electronic payments methods.

**Part II** will provide a brief history of digital money in an attempt to explain the uniqueness of the current European debt crisis. We will also investigate why a solution has so far not been found to return people to full employment.

**Part III** shall conclude that a portion, if not all, electronic money should be created by the Central Bank and spent into circulation by the Government as debt-free money. We will address some concerns this may bring.

## About the Authors

**Paul Ferguson** has a background in engineering and mathematics and graduated with a first class honours degree in both from Trinity College Dublin in 2005. He has studied economics informally for the last three years when there appeared to be a lack of understanding from economics graduates of how the business cycle operates. In particular there appeared to be little knowledge over how the money supply could lower during a recession. He set up Sensible Money in January 2012 primarily to address the confusion over how digital money is created and by whom. Sensible Money is also promoting what they feel to be the optimum solution to the European debt crisis taking into account the many factors involved.

**James McCumiskey** also has a background in engineering although his career has primarily been in accountancy. He has also studied economics informally for over three years and shares the same concerns regarding the lack of understanding by politicians, the media and even some economists about the modern money creation mechanism. James has written a book, *Real Honest Money*, currently with the publishers proposing similar reforms to Sensible Money.

# Contents

<b>Part I: How modern economies operate</b>	<b>4</b>
1.1 The importance of money	4
1.2 The origin of digital money	4
1.3 The disappearance of digital money during a recession	4
1.4 Some side effects of creating and deleting money in this way	5
1.4.1 The inevitability of defaulting	5
1.4.2 The need for perpetual growth	5
<b>Part II: Why this recession is so unique</b>	<b>6</b>
2.1 A brief history of digital money	6
2.2 Sources of debt free money	6
2.2.1 The national debt	6
2.2.2 An accelerating money supply	7
2.3 Why is this recession so unique?	7
2.4 Analysing potential solutions to the debt crisis	8
2.4.1 Adjusting interest rates to near zero	8
2.4.2 Quantitative Easing	8
2.4.3 ECB lending new money directly to Governments	8
<b>Part III: Debt free digital money as a means of solving the debt crisis and encouraging the objectives of the NPP</b>	<b>9</b>
3.1 The need for a source of debt free digital money	9
3.2 The possibility of an entirely debt free money supply	9
3.3 The Central Bank's role in money creation	9
3.4 Controlling the creation of bank credit	10
3.5 Demand deposits as legal tender	10
3.6 Dealing with current accounts	10
3.7 Dealing with savings accounts	10
3.7.1 A low-risk, low-return investment	11
3.7.2 A high-risk, high-return investment	11
3.8 A note on loan defaults	11
3.9 The transition	12
3.10 Addressing some concerns with our proposal	12
3.10.1 The need to control inflation	12
3.10.2 Would there be enough money for lending?	13
3.10.3 Would it be economically viable to run a financial institution?	13
3.10.4 How would this affect international trade?	13
3.11 Examples of the effective issuance of debt free money	13
3.11.1 Wörgl, Tyrol, Austria	14
3.11.2 The island of Guernsey	15
3.12 Conclusion	15
References	15

# Part I: How Modern Economies Operate

## 1.1 The Importance of Money

The lifeblood of any economy is its media of exchange. And yet it appears that very little attention is given by economists to the study of how digital money, in particular, originates. As this submission will show our supply of money created as non-repayable cash and coins has dwindled in favour of bank credit which comes with a corresponding debt. This has had significant effects on our economy. It has not happened through careful design by economists but by arbitrary advances in our electronic payments systems. Like the National Payments Plan we welcome such advances. However we must acknowledge the importance of the fact that every digital euro has a matching debt, in contrast to currency. Encouraging a move away from currency as a means of payment could have undesirable consequences, unless a new source of digital money is introduced to complement or replace existing sources.

## 1.2 The origin of digital money

Somewhat in contrast to the purpose of this submission we feel that digital money plays by far the most significant role in our payments system. Hence it's important to recognise that digital money originates through commercial bank loans. When finalising loans, commercial banks simply increase the borrowing customers current accounts without decreasing any other account. At a grass roots level they do this by typing a higher balance into the borrowers account. This is where digital money comes from and so every digital euro has a corresponding debt.

There are some procedures to adhere to before a bank manager creates new money for a loan. For example, banks are supposed to create money somewhat proportional to base money in their reserve accounts at the Central Bank. They also have to manage their liquidity and solvency and check the creditworthiness of potential borrowers.

But the fact still remains. For new digital money to enter circulation someone has to organise a bank loan. This brings new money to the economy but we cannot ignore the fact that bank credit is created in parallel with debt. We see this as the root cause of the debt crisis. Any new money required to stimulate growth in the economy will also have a matching debt. We see this as the reason that the current debt crisis has so far proved difficult to resolve.

## 1.3 The disappearance of digital money during a recession

When commercial banks process loans they create new demand deposits. Demand deposits aren't legal tender. Instead they are an agreement to pay the borrowing customer the legal tender on demand. New bank loans become potential demands for legal tender and hence they are recorded on the liabilities side of the bank's balance sheet. Equally, the borrowing customer's pledge to repay the newly created money is recorded on the assets side of the banks balance sheet.

Upon repayment of a loan both entries of the balance sheet are lowered to zero and the

money has effectively been deleted.

In conclusion, repayments of debts of electronic money removes both the debt, and significantly, the money from existence. This is why the money supply is significantly reduced during a recession.

## **1.4 Some side effects of creating and deleting digital money in this way**

### **1.4.1 The inevitability of defaulting.**

As part II will explain in further detail we've had decades whereby Government created debt free cash has complimented bank created credit. With a significant proportion of the money supply existing as debt free cash circulating continuously, previous generations have found it easier to repay bank loans than today's generation.

Because our use of cash has lowered, today's generation find it difficult to repay bank loans in full primarily because what's in circulation is the principal, or partial principal, of every loan. What's owed back is the principal, or partial principal, plus interest. We owe more digital money than exists<sup>1</sup>.

Although in theory all bank loans could be repaid in full, in practice it's impossible. Demonstrating this through an extreme example, imagine everyone repaid all loans to commercial banks. Every bank account would read zero. Before it comes to this someone will default on a loan even if, for example, banks lent only to individuals and institutions with the highest credit rating.

### **1.4.2 The need for perpetual growth.**

Our digital money supply is constantly at threat of being reduced through loan repayments. In order to repay past loans without reducing the money supply we are forever dependant on more bank loans.

To increase GDP, strongly linked to the money supply<sup>2</sup>,we need to collectively organise more bank loans year on year. Exponential growth as a means of stability has flawed logic in a finite world.

## Part II: Why this recession is so unique

### 2.1 A brief history of digital money.

At one stage precious metals, denominated in standardised units as coins, were used as the main medium of exchange. For security of storage, many people choose to leave their coins in purpose built vaults. A paper receipt would be given to depositors and it soon became apparent that trading using these paper receipts was better than trading with the actual coins themselves. This was the birth of paper money.

When people went to the vault keeper for loans they often choose the convenience of the paper receipts and eventually the vault keeper, or banker, issued paper receipts in excess of the coins in the vault. This was temporarily a helpful thing for the economy since a growing population cannot function well with a finite money supply such as that based on precious metals. Vault keepers or banks, effectively acting as country wide printing presses, also distributed new money more effectively than perhaps a Government based in the capital city could.

However the system repeatedly broke down due to lack of confidence in the receipts. To restore confidence the practice was legalised and it later became known as fractional reserve banking. Eventually links to precious metals were abandoned and Central Banks assumed the role of sole issuers of bank notes and coins in an attempt to provide more economic stability. In Ireland this happened under the 1845 Bank (Ireland) Act<sup>3</sup>.

There was an unavoidable side affect to this attempt at stability however. Although banks, well established by this stage, could be prevented from issuing new bank notes they could not be prevented from recording new entries in their bank ledgers when processing bank loans. These entries were effectively new money although technically they were simply agreements to pay cash on demand. As private companies, banks could make as many agreements to pay cash as they saw fit. Today, the system is better regulated again and digital money replacing ledger entries is easier to police.

### 2.2 Sources of debt free money

#### 2.2.1 The need for a source of debt free money to stabilise bank credit.

As noted in section 1.4 a money supply existing entirely with an even higher debt cannot form the basis of a stable economy in practice.

However until 2008 we've always had a size able source of debt free money.

As recently as the 1960s Britain's M3 money supply consisted of around 20% debt free cash and coins<sup>4</sup>. We assume Ireland's economy enjoyed a similar percentage until later perhaps. This has acted a buffer to the 80% of bank created credit carrying a debt. It is also worth noting that even though 80% of M3 consisted of bank credit, the 20% cash

and coins would have formed a higher percentage of the effective money supply than 20%. This is because the trust involved in a cheque transaction was needed for bank credit to act like money. All 80% of bank credit forming M3 would not have done so continuously.

Today, as we're sure the National Payments Plan is aware, around 6% of M3 consists of cash and coins<sup>5</sup> in Ireland and the other 94% is no longer restricted by the limits of chequebook transactions.

From the 1960s onwards we've had a number of indirect sources of debt free money as replacements for the 'cash buffer'. These are discussed below.

### 2.2.1 The national debt.

The national debt, despite its name, can feel like a source of debt free money to the economy. This is because it can grow without being repaid in full. Ordinarily businesses and households within the economy each have to incur a debt to have any money to trade. Money entering the economy through the national debt is money that neither businesses, nor households have had to borrow into existence. And yet it circulates between them as effectively debt free money.

The use of a national debt as a source of debt free money is no longer feasible.

### 2.2.2 An accelerating money supply.

The money supply has increased dramatically globally in developed economies since the 1970s. For many European countries the money supply has doubled about every ten years, or quadrupled about every twenty years<sup>6</sup>. Repaying early bank loans under such conditions can prove relatively easy. Such an exponentially growing money supply can feel like a source of debt free money if the numbers involved dwarf previous bank loans and repayments are spread over many years.

## 2.3 Why is this recession so unique?

Before the 1930s businesses took on a significant portion of the bank loans required for money to come into existence<sup>7</sup>. Eventually businesses were reluctant to take on more debt.

Since the 1930s Governments and households have been the main borrowers of money. However as discussed above Governments are now becoming reluctant to take on more debt.

Even more obvious is the fact that mortgages now take two careers to repay and cannot increase further. Hence households can no longer take on ever increasing amount of debt.

The national debt and an accelerating money supply are no longer acting as sources of debt free money. Hence this is a very unique recession.

## 2.4 Analysing potential solutions to the debt crisis

### 2.4.1 Adjusting interest rates to near zero.

This technique employed by the ECB, the Bank of England, the Federal Reserve and many others is understandably designed to encourage more bank loans since this is where money comes from in modern economies. Of course all bank credit has a debt recorded against it so this practice cannot solve the debt crisis per se.

### 2.4.2 Quantitative Easing

Although not employed by the ECB, rounds of QE have been tried by the Federal Reserve Banks of America and the Bank of England.

For clarity, QE involves raising the amount of money in the reserve accounts of the commercial banks by purchasing assets from them with newly created base money. Although this can encourage commercial banks to create new digital money, again this can only happen through the bank loan process and any new money will still incur a matching debt hampering this tool as a means of resolving the debt crisis.

### 2.4.2 ECB lending new money directly to Governments

The ECB has lent directly to Governments via the purchase of bonds with newly created base money. Of course unless the rules, and perhaps the mentality surrounding money, are changed the ECB can never give base money to a Government without recording a debt. But given that every digital euro, even base money, comes with a corresponding debt it's difficult to solve the debt crisis under this system.

# **Part III: Debt free digital money as a means of solving the debt crisis and encouraging the objectives of the NPP**

## **3.1 The need for a source of debt free digital money**

As discussed in section 2.2.1 it appears economies cannot function well without a source of debt free money. As sections 2.3 and 2.4 confirmed our sources of debt free money are strained. We're unwilling or unable to create the many bank loans needed to increase the money supply and consequently GDP. All this despite low interest rates, some quantitative easing, the ECB lending directly to Governments and encouragement given to banks to create new credit.

As such at the very least we'd recommend that a portion of the money supply should be created by the central bank and given to the Government to be spent into circulation as debt free digital money. This would be a modern day replacement for the cash money supply which the economies of previous years enjoyed. The required proportion of debt free digital money for stability and inflation control is hard to decipher. However many stable and low inflation economies have existed with a debt free cash supply of around 20% and there's no reason to suspect that a debt free digital money supply of around the same figure would behave any differently. Examples include America from 1919 - 1929, Britain 1940 – 1969 <sup>6</sup>.

## **3.2 The possibility of an entirely debt free money supply**

However, we don't see why the entire money supply, cash and digital, could not exist as debt free money overall. Borrowing of existing money would of course involve a creditor and debtor but upon repayment the borrowed money would not be deleted as it is today.

As such, we would not be as dependent on new money as we are today although we would still need some institution to create money to service a growing population with growing productivity.

## **3.3 The Central Bank's role in money creation**

As the current crisis shows commercial banks cannot be trusted nor expected to issue new money with the macro-economy in mind. Governments also have a bad reputation whenever they've been in charge of creating money. As such we would see the Central Bank as the best judges of the required amount of new money needed to facilitate trading within the economy.

The Central Bank would create the new money expected to meet the demand for trading and type it directly into the Government's bank account whereupon it would be indistinguishable from money collected through taxes.

The Central Bank would create money with the sole objective of inflation control in mind, while the Government would decide how best to spend it. This would be the main

safeguard against hyperinflation since neither institution would benefit from influencing the other's decisions.

### **3.4 Controlling the creation of bank credit**

To control the creation of money by commercial banks we'd need two types of accounts, which we already have. Namely current account and savings accounts.

If you have money in a current account only you can use it. If you have money in a savings account only the bank can use it.

This is known as full reserve banking, amongst other things.

### **3.5 Demand deposits as legal tender**

Part of this proposal would involve acknowledging demand deposits as legal tender. Technically we're only allowed to pay taxes and/or court fines with cash and coins as the only forms of legal tender for all debts, public and private. We would finally recognise demand deposits as money, as opposed to an agreement by a private company to pay legal tender.

### **3.6 Dealing with current accounts**

Current accounts would no longer be liabilities of the commercial banks and would be removed from the banks' balance sheet as a result. More detail on the appearance of the banks' balance sheets will follow in section 3.9.

Currents accounts, consisting of demand deposits, would now be 100% safe. Financial institutions, not necessarily limited to traditional banks, could manage current accounts and transfer numbers from one account to another as means of payment. In the event of one financial institution failing the accounts held would transfer to other financial institutions.

Consequently there would be no need for deposit insurance. There would also never be a bank run, nor bank bailout again.

If anyone wanted to save money completely risk free they could leave money dormant in their current account.

### **3.7 Dealing with savings accounts**

Savings accounts, more accurately described as investment accounts, would be slightly more complicated. Financial intermediaries, again not necessarily limited to traditional banks, would only be able to lend existing money and as such they would have to attract the funds they require for lending.

At the point of opening a savings account the bank would be required to inform the customer of the intended uses for the money that will be invested along with the expected risk level.

The risk of the investment now stays between the bank and the investor rather than the taxpayer. Brief examples of how savings accounts might be handled are described below.

### 3.7.1 A low-risk, low-return savings account

An example of a low risk, low return investment might be mortgages to middle income families.

The bank might charge an interest rate of 6% on these mortgages, knowing that these loans are quite safe. Allowing for defaults, the normal case rate of return will be around 5.8% overall and in the worst case scenario, with a high rate of defaults, the rate of return might drop to 2%.

In this scenario the bank would guarantee a rate of return of perhaps 1.5% to investors. This provides a good investment vehicle for savers/investors who don't want to take much risk.

### 3.7.2 A high-risk, high-return savings account

An example of this type of investment might be an emerging market tipped to become much bigger.

In this scenario the bank might attract savers by offering a rate of return of perhaps 6% while lending to borrowers at perhaps 12%. If everything goes according to plan both the bank and the saver get the return they expected.

However if the emerging market proves unsuccessful the bank may only receive perhaps 60% of the money it lent. In this case the bank might only guarantee the investor a return of 70% of their money with the bank paying the 10% shortfall from its profits.

## 3.8 A note on loan defaults

Today every digital euro originates through a bank loan, which creates an even higher debt. Since almost all money is now digital in practice it's impossible for all bank loans to be repaid. However if banks were to lend only existing money it would be entirely possible for all loans to go according to plan. The scenario described in section 3.7.2 would not happen as often as today. Furthermore in theory such a scenario shouldn't have an adverse macro-economic effect since someone else within the economy would still have the lent money not returned.

There is no reason, ethically speaking, why bad loans should be guaranteed by a third party.

Finally, if an emerging sector couldn't attract enough investors then the market will have spoken on its potential even though the emerging sector might have brought real benefits to the community.

### **3.9 The transition**

The transition to full reserve banking would happen quite slowly for the reasons described below. From the date of changeover all demand deposits would be removed from the liabilities side of the banks' balance sheets and become accounts holding numbers representing legal tender. Time deposits maturing to demand deposits would be treated in the same way.

For clarity, no action would be required by the general public and Governments could still borrow money via the sale of bonds. Time deposits would be honoured as per their original contracts although we would expect some flexibility in renegotiating them since they would probably form the immediate source of money available for lending if the holders agreed.

Debtors would also be removed from the assets side of the banks' balance sheets and would become entries on the assets side of Central Bank's balance sheet. As debtors repay the commercial banks, the money would be transferred to the Central Bank whereupon the debt would be settled. The Central Bank would remove the relevant entry and the money would effectively be deleted as happens today.

This arrangement would occur until the last repayment of a loan made before the changeover date. The bulk of the changeover would naturally occur within 30 years since most of our digital money originates from mortgages of this duration.

In the meantime, commercial banks would have to attract investors and upon doing so money would leave current accounts and enter the banking sector's pool for investment as liabilities on their balance sheet.

Upon finalising a loan the money would reenter circulation by being transferred to the borrowing customer's current account. Their agreement to repay the loan would become an entry on the asset side of the bank's balance sheet.

### **3.10 Addressing some concerns with our proposals**

#### **3.10.1 The need to control inflation**

Controlling inflation is given the highest priority in economics and rightly so. There is a school of thought that the issuance of debt free money into circulation will somehow be more inflationary than commercially profitable bank credit. We believe this reputation arose from the original behaviour of the two sources of new money.

Initially bank credit was issued to industries which gave life to a corresponding increase in products. Hence bank credit caused little inflation. In contrast Governments were less concerned with productive activity and excess issuance of debt free cash caused hyperinflation.

However today bank credit is rarely afforded to productive activities but naturally, it is instead given to whatever speculative investment appears to be the most profitable. This is the main reason why we live in such a high inflation economy. When consulting the

consumer price index only we may appear to live in a low-inflation economy. When factoring in the rise in house prices and the lowering of the household's disposable income we see a different picture<sup>8</sup>.

We also believe that our current system is perhaps the least-deflationary we've ever had. While businesses may reduce overheads, the cost of production and so on, debt repayments form a 'floor' price below which there is no point in selling.

As such we see no reason why the issuance of debt free money would be more inflationary than our current system.

The Central Bank's tool of directly creating and deleting money from the Government's account would obviously be far more effective than indirect control through adjusting interest rates.

The Government would still have an inability to create money while the Central Bank would behave as responsibly as it does today in adjusting interest rates.

The system would also be policed through international trading. Since the amount of new money being created by the Central Bank would be published, a country would lose international credibility if it created what was considered to be an excessive amount of new money. Its exchange rate would adjust accordingly.

The following safeguards could also be put in place if it were deemed necessary.

- *The absolute amount of the increase in any one month must be no more than x% greater than the previous month.*
- *The total annual increase in the money supply should not exceed x% of the current total money supply*

### 3.10.2 Would there be enough money for lending?

For a start we wouldn't be as dependent on loans and credit since this would no longer be the source of new money. Entrepreneurs could more easily earn existing money to start a business than today.

Also we would live in a more stable economy where perhaps only in cases of extreme population decline would an area delete any money. And so investors are more likely to have longer periods of confidence than today.

Also the demographics of the population would keep the system well regulated. We'd always have a portion of the population saving for a house, or a pension et cetera and as soon as they stop the next generation will start.

But suppose, taking the extreme example, all the money in the economy was in current accounts and there was no money available for lending. On approach to this strange scenario the Central Bank would see this as a sure sign that more money was needed in

the economy. An injection of digital money into the economy via Government spending would encourage investment. If this failed the Central Bank would take the emergency action of putting some of its money into a savings account for would-be entrepreneurs.

### 3.10.3 Would it be economically viable to run a financial institution?

Occasionally we hear that it would be too expensive to run a bank without the benefits they currently receive from creating digital money at very low cost. Interest rates would no doubt increase and banks would no doubt have a variety of charges for managing current accounts so one way or another banks would make it profitable to be in business.

The other side of the argument is sometimes made that it would be too hard to do non-banking business since bank charges would be so high. Of course the hardest economy to do business in is today's in which more money is owed than exists and money is constantly scarce.

### 3.10.4 How would this affect international trade?

Under the current system every economy is keen to have a large exporting sector since this brings money into the economy while the associated debt stays with the importing country. It is worth noting that a net importing country will find it even more impossible to pay its domestic debts so this isn't a good system from the global economy's viewpoint.

Regardless of this point creating money with an equal debt does promote international trade and this incentive would be lost under our proposals. A breakdown in international trade isn't realistic regardless of what monetary system we employ. However, we do concede that some international trade that occurs today wouldn't occur under our proposed reform.

## 3.11 Examples of effective issuance of debt free money

### 3.11.1 Wörgl, Tyrol, Austria

Like many places in the 1930s the town of Wörgl in Austria was suffering from the effects of the Great Depression. The town had unemployed people and much work to be done but lacked a medium of exchange to bring it all together.

The Mayor, Michael Unterguggenberger, issued a new currency called 'certificates for services rendered'. It was issued debt free and kept valuable by being the only currency with which to pay local taxes.

The Wörgl currency enabled unemployed people to perform useful work and the town benefited from well-maintained streets, a new drainage system, street lighting, a ski jumping platform, bridges and a new reservoir. The scheme was a great success. Mayor Unterguggenberger added his own touch by having the currency depreciate by 1% a month. While this does increase circulation of the currency we're not promoting this tactic as part of our proposal.

The success story of Wörgl spread and over 200 Austrian mayors proposed similar local debt free currencies. However the Austrian Supreme Court ruled such local currencies

unconstitutional on 1st September 1933 to the detriment of Wörgl and its neighbours<sup>9</sup>.

### 3.11.2 The Island of Guernsey

Debt free money creation has been taking place in Guernsey for almost 200 years without hyperinflation<sup>10</sup>.

Dr. Bob Blain, Professor of Sociology at Southern Illinois University, wrote of the island of Guernsey in 'The other way to deal with the national debt' *Progressive Review* (June 1994).

"In 1816 its sea walls were crumbling, its roads were muddy and only 4 1/2 feet wide. Guernsey's debt was 19,000 pounds. The island's annual income was 3,000 pounds of which 2,400 had to be used to pay interest on its debt. Not surprisingly, people were leaving Guernsey and there was little employment.

Then the government created and loaned new, interest-free state notes worth 6,000 pounds. Some 4,000 pounds were used to start the repairs of the sea walls. In 1820, another 4,500 pounds was issued, again interest-free. In 1821, another 10,000; 1824, 5,000; 1826, 20,000. By 1837, 50,000 pounds had been issued interest free for the primary use of projects like sea walls, roads, the marketplace, churches, and colleges. This sum more than doubled the island's money supply during this thirteen year period, but there was no inflation. In the year 1914, as the British restricted the expansion of their money supply due to World War I, the people of Guernsey commenced to issue another 142,000 pounds over the next four years and never looked back. By 1958, over 542,000 pounds had been issued, *all without inflation.*"

### 3.12 Conclusion

We encourage the efficiency of electronic payments as do the NPP. However, we would promote caution until some source of debt free digital money is introduced in the economy to replace cash, which is a diminishing source of debt free money.

We recognise that Ireland has a relatively small economy, deals with an international currency and has accepted an IMF loan. As such we are realistic about our proposal to implement the issuance of an entirely debt free money supply any time in the near future. While we would be happy to explain any aspect of our proposal in more detail, we would urge more consideration of at least a partial implementation of a source of debt free digital money.

### References

1. Central Bank of Ireland, 2011, *December 2011: Credit Institutions Aggregate Balance Sheet*, (Central Bank of Ireland). 'Loans to Irish Residents' reads €467billion while 'Deposits from Irish Residents' reads €346billion.

2. Zapodeanu D., Cociuba M.L., 2010, *Linking Money Supply with Gross Domestic Product in Romania*. ([www.oeconomica.uab.ro/upload/lucrari/1220101/50.pdf](http://www.oeconomica.uab.ro/upload/lucrari/1220101/50.pdf) accessed 12/01/12).
2. Fisher's Equation,  $mv = pq$ .
3. Honohan P., 2004, *The Irish Pound*, The Encyclopedia of Irish History and Culture, (New York: Macmillan Reference).
4. Rowbotham M., 1998, *The Grip of Death* p264 (Jon Carpenter).
5. Central Bank of Ireland, 2011, *Money and Banking Statistics: December 2011, Table A.3 Money Supply - Irish Contribution to Euro Area*, (Central Bank of Ireland).
6. European Central Bank (1998-2007), *Latest monetary, financial markets and balance of payments statistics* (<http://www.ecb.int/stats/services/downloads/html/index.en.html>).
7. U.S. Census bureau data from 1916 to 1930. E.g. In 1929 Industry debt equated to 51.3% of total debt, personal debt equated to 17.2%.
8. U.S. Flow of funds data 1990 - 2011. E.g. Household debt payments service as a percentage of disposable personal income rose from 10.7% in 1994 to 14% in 2008.
9. Helleiner E., 2003, *The Making of National Money - Territorial Currencies in Historical Perspective* p158-159, (Cornell University Press).
10. Grubiak J., Grubiak O., 1963, *The Guernsey Experiment (Prospectus) 3rd Edition*, (Hawthorne, California Omni Publications).