Applying the Quantity Theory of Credit:
The role of the ECB in the propagation of the
European financial and sovereign debt crisis and
the policy implications

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Abstract. The financial crisis has led to the call for a new research programme on the
link between banking and the economy, as a new consensus among economists has been emerging that it is necessary to include a banking sector in macroeconomic models, and include systemic, macroeconomic feedbacks in the finance and banking theory. There is a model that fulfils the requirements by distinguishing between different types of bank credit – credit boosting GDP and credit boosting asset prices and causing banking crises. It is consistent with the empirical record. In this paper the implications of this model are explored for the analysis of the causes of the financial crisis, the role of the ECB and the design of a financial architecture that is more stable and likely to deliver sustainable growth.

Keywords: bank credit, banking and the economy, credit creation, disaggregation of credit, methodology, quantity equation, macroeconomics

JEL Classification: E41, E52, E58
1 Introduction

Thanks to the banking crisis, a broader spectrum of the public became aware of the fact that leading economic theories and models, as well as influential advanced textbooks in macroeconomics and monetary economics, did not feature money (e.g. Woodford, 2003), or banks (Walsh, 2003; Woodford, 2003). Donald Kohn (2009), as Vice-Chairman of the Federal Reserve, reflected the sense of embarrassment of the economics profession when having to admit to the public that economic models simply assumed that banks did not exist:

“It is fair to say ...that the core macroeconomic modelling framework used at the Federal Reserve and other central banks around the world has included, at best, only a limited role for ...credit provision, and financial intermediation. ...asset price movements and the feedback among those movements, credit supply, and economic activity were not well captured by the models used at most central banks.”

While economists seem to have taken the brunt of the public critique triggered by the crisis, researchers in the fields of banking and finance also failed in delivering prescriptions, tools and recommendations for appropriate regulation, supervision and risk management to avoid banking crises. A fundamental problem seems to be the very separation of disciplines into economics on the one hand, with the potential to capture systemic and macroeconomic aspects, and finance and banking on the other, with the potential to model banks in detail. The separation allowed the systemic importance of banks to remain unnoticed: The economists have tended not to model the financial infrastructure and banking, and the finance and banking researchers have tended not to be concerned with macroeconomic effects of the collective behaviour of financial intermediaries. Focusing on microeconomic studies of representative financial institutions, they neglected the systemic effects of individual bank behaviour that may affect the entire economy and thus generate important feedback to financial intermediaries. Both disciplines had developed in a way that blindsided them concerning banking crises.

It could thus be said that economics needs more finance and banking, while finance and banking need more economics.¹ Fifteen years ago what must be the simplest possible model was proposed that incorporates banking into a basic macroeconomic framework and which is able to explain banking crises, as well as solve a number of observed ‘anomalies’ in macroeconomics and finance – published in the journal *Kredit und Kapital* (Werner, 1997). This model is briefly restated, before the policy implications are drawn for immediate measures that would end the current European crisis and the design for a stable and sustainable financial architecture in Europe.

¹ This was the message of the call for a new interdisciplinary research programme on ‘Banking and the Economy’, issued at the first European Conference on Banking and the Economy (ECOBATE), held on 29 September 2011 at Winchester Guildhall, and organised by the Centre for Banking, Finance and Sustainable Development, University of Southampton Management School.
2 An Alternative Model, Based on the Inductive Method

2.1 ‘Anomalies’ of the Old Approaches

Until about the mid-1980s, the hitherto prevailing approaches (classical, many neo-classical, Keynesian, monetarist and post-Keynesian approaches, as well as most eclectic models), despite their differences, had much in common. They still included a monetary aggregate that was linked to nominal GDP through the quantity equation:

\[(1) \quad M \cdot V = P \cdot Y\]

whereby \( M \) stands for the money supply (measured and defined variously as \( M_0, M_1, M_2, M_3 \) or \( M_4 \)), \( V \) denotes the (income) velocity of money, which has to be stable for a reliable relationship between money and the economy, \( P \) the GDP deflator (the appropriate price level) and \( Y \) symbolises real GDP. PY hence represents nominal GDP. Expressed in logarithms, this relationship can also be stated as:

\[(2) \quad m + v = p + y\]

Since the 1980s, the mainstream as well as several heterodox approach to macroeconomics have faced the problem of an increasing number of ‘anomalies’ – empirical facts that seem to contradict the theories. The list starts with the widespread empirical observation that velocity had become erratic, was declining significantly and the money demand function was unstable (e.g. Hendry, 1985; Belongia and Chalfant, 1990; Boughton, 1991). The ‘quantity equation’ relationship, expressed as a stable income velocity, “came apart at the seams during the course of the 1980s” (Goodhart, 1989). The implications for macroeconomics were far-reaching. This empirical failure not only discredited monetarism, but posed a major obstacle to all the other schools of thought as well, most of which had previously relied on the quantity equation in some way. As one monetary aggregate after another succumbed to an unstable relationship with nominal GDP, the profession became ever less specific about the very definition of money. Today, textbooks, as well as leading central bank publications, state that they do not know just what money is. In the words of then Federal Reserve staff:

“...there is still no definitive answer in terms of all its final uses to the question: What is money?” (Belongia and Chalfant, 1990, p. 32).
The empirical failure to define money without much ambiguity has been one of the weaknesses of the macroeconomics prevalent until about the mid-1980s, and it is one that remains unresolved. Motivated by the velocity decline and this inability to define money clearly, in the 1980s leading economists called for the adoption of “an alternative paradigm” (Spindt, 1987; Judd and Scadding, 1982; Gordon, 1984; Roley, 1985).

We know that this was the time at which the paradigm of moneyless economic models, real business cycle theories and supply-side economics became influential. Given that the profession had a fundamental problem with handling money, such moneyless models must have become more appealing to economists. If nothing else, they seemed to offer an escape route from an apparently intractable problem. Instead of rising to the challenges posed by the velocity decline and getting to the root of the problem, economists simply assumed away the problem, by operating on the empirically unsupported premise that money (and banks) did not matter.

But the role of banks had remained a persistent puzzle in macroeconomics – whether of the pre- or post-1980s type. Because of the belief that they are mere financial intermediaries without any special features that would justify a unique representation, they have not been explicitly modelled in a meaningful way in the major macroeconomic theories and models over the past thirty years. There is however a small though important body of evidence to the effect that banks are special in some way that standard theory cannot explain (e.g. Fama, 1985; Peek and Rosengren, 2000; Ashcraft, 2005; Werner, 1992; Werner, 2005; Leary, 2009; Voutsinas and Werner, 2011). Blanchard and Fischer (1989) pointed out already more than twenty years ago:

"The notion that there is something about banks that makes them ‘special’ is a recurrent theme.” (p. 478).

With banks unexplained, so has been the powerful phenomenon of the recurring banking crises, which time and again provide a stark reminder that banks indeed have an important role to play in the economy.

A further major ‘anomaly’ has been the fact that the central economic variable – the one emphasised since the mid-1980s as the main driving force of economic and financial market activity, namely interest rates – could not be shown to operate empirically in the way theory required: Empirically, interest rates seem far less powerful in explaining business cycles or developments in the economy than theory would have it.² In empirical work, interest rate variables often lack explanatory power, significance or the ‘right’ sign.³ When a correlation between interest rates and

² See Melvin (1983) and Leeper and Gordon (1983), who found little support for the so-called liquidity effect of interest rates on the money supply.
³ King and Levine (1993) did not find evidence to support the hypothesized relationship between real interest rate and economic growth in a cross-section of countries. Taylor (1999) found that the link between real interest rates and macroeconomic aggregates such as consumption and investment is tenuous.
economic growth is found, it is not more likely to be negative than positive. Interest rates have also not been able to explain major asset price movements (on Japanese land prices, see Asako, 1991; on Japanese stock prices, see French and Poterba, 1991; on the US real estate market see Dokko et al., 1990), nor capital flows (Ueda, 1990; Werner, 1994) – phenomena that in theory should be explicable largely through the price of money (interest rates) or its differential. Furthermore, in terms of timing, interest rates appear as likely to follow economic activity as to lead it.

This became apparent when the Japanese central bank lowered interest rates over a dozen times in the 1990s, while the economy continued to stagnate and the money supply failed to expand. But Keynesian, post-Keynesian and even most monetarist advice was based on a monetary transmission mechanism via interest rates.

There were many attempts at explaining this phenomenon, producing the voluminous ‘credit view’ literature (including the ‘bank lending view’ and the ‘balance sheet channel’ approach; see Bernanke and Gertler, 1995). These attempts also failed: They could not resolve the empirical puzzle, because according to its proponents the additional credit channel of monetary transmission should enhance the role of interest rates. This was evidently not the case in Japan or a number of other major economies. As a result, key proponents began to distance themselves from this approach (Bernanke, 1993; Bernanke and Gertler, 1995).

An attempt was made to explain the apparent failure of falling interest rates to stimulate the economy by reviving the ‘liquidity trap’ argument, originating in Keynesian approaches, and subsequently adopted by rational expectations theories (Krugman, 1998). While there is a widespread perception that the ‘liquidity trap’ explanation has been successful, in fact it failed to even ask the right question, let alone offer an answer to it: The liquidity trap argument is about a situation where interest rates have fallen to their lowest point, and it merely argues that, at this point, interest rate-based monetary policy cannot be effective (since rates cannot be reduced further). However, in Japan interest rates reached their lowest point only in March 2003, after over a decade of recession and over a dozen interest rate reductions. As to the relevant question at hand, namely why repeated interest rate reductions over a decade have failed to stimulate the economy, the liquidity trap argument has nothing to say. As it turns out, the liquidity trap argument is merely the restatement of the

4 Kuttner and Mosser (2002) pointed out the positive correlation between GDP growth and interest rates in the US between 1950 and 2000. Dotsey, Lantz and Scholl (2003) examined the behaviour of real interest rates. Their results disclosed the real interest rate series is contemporaneously positively correlated with lagged cyclical output. Other studies finding a positive correlation between interest rates and growth include Gelb (1989), Polak (1989), Easterly (1990) and Roubini and Sala-i-Martin (1992). This positive relationship between interest rates and growth is also acknowledged in a leading textbook in advanced macroeconomics (Sorensen and Whitta-Jacobsen, 2010). For a comparative empirical study on the US, UK, Germany and Japan, see Werner and Zhu (2011).

5 While Stock and Watson (1999) find that the nominal rate is a leading business-cycle indicator, short-term interest rates, since influenced by central banks, tend to follow nominal GDP growth. The same also seems to apply to long-term interest rates (Werner, 2005). Gurkaynak, Sack, and Swanson (2005) showed that long term interest rates react to various macroeconomic shocks that in the conventional macroeconomic models are only expected to affect short-term interest rates.

6 For a survey of how the literature has dealt with the ineffectiveness of interest rate policy in Japan, see Werner (2006).
tautology that rates cannot fall further when they have fallen to the lowest possible point.

For interest rates to play the role theory suggests, the money and credit markets have to be in equilibrium. But Japan’s recession, about to enter its third decade, makes sport of the contention that in the medium to long run markets are in equilibrium. Many economists have been trained to avoid contemplating the possibility that markets may never be in equilibrium. Yet, this is a distinct possibility. In such a world, it would not be prices (such as interest rates) that determine outcomes, but quantities (such as the quantity of credit). Even Blanchard and Fischer (1989) noted, in a comment that echoes their sentiment on the missing role of banks:

“A recurrent theme in the literature and among market participants is that the interest alone does not adequately reflect the links between financial markets and the rest of the economy. Rather, it is argued, the availability of credit and the quality of balance sheets are important determinants of the rate of investment” (p. 478).

This has stirred interest in the credit rationing argument (Jaffee and Russell, 1976; Stiglitz and Weiss, 1981). However, even this eminently sensible explanation, for which a growing empirical literature has collected supportive evidence, raised more questions than it answered: the credit rationing argument itself does not explain why available alternatives to domestic bank credit (foreign bank credit, direct finance, equity issuance) failed to compensate for credit supply constraints. In effect, credit rationing is a microeconomic argument without any explicit macroeconomic implications. However, it is macroeconomic issues that require explanation: why have interest rate reductions failed to stimulate the economy, and why could non-bank sources of funding not compensate for lack of bank credit?

Proponents of real business cycle theories have argued that macroeconomics should respond to the challenges posed by the financial crisis by incorporating a financial or banking sector into DSGE models. This however would constitute an *ad hoc* modification of a fundamentally incompatible approach. Instead, it would seem a new paradigm is needed, as Joseph Stiglitz and collaborators had again called for before the recent financial crisis. The slow but steady rise of non-mainstream theories over the past twenty years, including institutional economics, experimental economics, psychological economics, behavioural economics and economic history – all sub-disciplines with an empirical orientation – suggests that momentum is building in favour of a paradigm shift towards a model developed from an inductive research methodology (unlike the prevailing paradigm, built on the hypothetico-deductive method). Werner (2012) has argued that it must rise to the challenge of explaining at least the seven central empirical puzzles in macro- and monetary economics (the last two of which have not been discussed in this paper):

1. The apparent velocity decline,
2. the identification problem of money,
3. of what makes banks special (while incorporating this feature appropriately into a macroeconomic model),
4. why there are recurring banking crises,
5. the

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ineffectiveness of over a decade of interest rate reductions in stimulating growth in Japan, (6) the success of the German and East Asian economic model, despite widespread government intervention and use of non-market mechanisms, and (7) the ineffectiveness of supply-side reforms (deregulation, liberalization, privatization) in enhancing economic performance in Japan and other countries.

In the following section a model fulfilling this requirement, originally published in Werner (1997), will be restated. It is then used to explore the policy conclusions for post-crisis measures and the design of a European financial architecture that delivers stable and sustainable growth without major crises, which is the main contribution of the present paper.

2.2 A Macro Model Incorporating Banking

Equations (1) and (2) are derived from Irving Fisher (1911), who, drawing on Newcomb (1885) and John Stuart Mill (1848), formulated it as follows:

\[ MV = PT \]

Fisher said that the ‘effective’ money MV (assumed to circulate and be used for transactions) is equal to the value of transactions (the sum of all pairs of prices times quantities transacted T).\(^8\) We can rephrase this slightly and say that, in its original form, the quantity equation stated:

*The total value of transactions during any time period must be the same as the amount of money used to pay for these transactions.*

This is now an equation that indeed is “valid under any set of circumstances whatever”.\(^9\) But there was an important drawback to Fisher’s equation. Data on Q was not readily available. As national income accounts were becoming increasingly available, Pigou (1917) and several of his colleagues at Cambridge University argued that the stock of money should be proportional to ‘total nominal expenditures’. Many Cambridge economists therefore replaced PQ with PY, yielding the most widely-known formulation of the quantity equation in (1) above.

This change in the definition of the quantity equation is usually undertaken with minimal justification. Milton Friedman, for instance, explains that

\(^8\) Fisher originally used the notation MV=PT, whereby T stands for the quantity of transactions.

\(^9\) Since Fisher had the concept of species in mind as money M, and since he realized that the total volume of transactions was much larger than the stock of gold or precious metals, he, like other economists at the time, felt that banking or other financial innovations served to economise on this stock of gold. Thus some kind of ‘multiplication factor’ was necessary – the number of times one unit of gold money M was used for transactions during the period of observation. This is velocity V.
“Fisher, in his original version, used $T$ to refer to all transactions – purchases of final goods and services..., intermediate transactions..., and capital transactions (the purchase of a house or a share of stock). In current usage, the item has come to be interpreted as referring to purchases of final goods and services only, and the notation has been changed accordingly, $T$ being replaced by $y$, as corresponding to real income” (Friedman, 1990, p. 38).

While it is undoubtedly true that it “has come to be interpreted as referring to purchases of final goods and services only”, which can be represented by GDP, Friedman fails to tell us why this is justified and what the implicit assumptions are. From a comparison with Fisher’s earlier formulation it is obvious that equation (1) is a special case that is only accurate if:

(4) $PY = PT$

or, in other words, if nominal GDP is a robust proxy for the value of total transactions in the economy for which money is changing hands. When considering growth rates, the lesser requirement applies that transactions proxied by GDP are a constant proportion of total transactions. However, it is neither clear that GDP accurately reflects all transactions in the economy nor that GDP-based transactions are a constant proportion of total transactions. Friedman (1990, p. 38), casually inserts the formulation “if we restrict purchases to final goods and services…” in his explanation of equation (1). But as Friedman acknowledges, Fisher originally included asset transactions. These constitute an important potential use of money $M$. They may be of substantial volume in modern economies – often a multiple of GDP – yet are not included in the GDP statistics, as the latter reflect income, value added in production and services or expenditure on goods and services only. Capital gains on assets are not included in the income definition. Financial sector transactions affect wealth, but are not part of income and hence GDP (for more details on national income accounting, see UN 1993, 2003, or Lequiller, 2004). Likewise, the majority of real estate transactions are not part of the GDP statistics.

Thus equation (1) will not be reliable, when the value of non-GDP transactions, such as asset transactions, rises. In those time periods we must expect the traditional quantity theory of money, $MV = PY$, to give the appearance of a fall in the velocity $V$, as money is increasingly used for transactions other than nominal GDP ($PY$). This explains why in many countries with asset price booms economists puzzled over an apparent ‘velocity decline’, ‘breakdown of the money demand function’ or a ‘mystery of missing money’.10

The solution is to break the general equation of exchange for all transactions into two flows – those for GDP (‘real’, hence subscript $R$) and those for non-GDP transactions (‘financial’, subscript $F$). As Friedman pointed out about equation (3):

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“Each side of this equation can be broken into subcategories: the right-hand side into different categories of transactions and the left-hand side into payments in different form” (Friedman, ‘Quantity Theory’, Encyclopedia Britannica, 15th edition, p. 435).

This was first successfully implemented by Werner (1992, 1997). Substituting the slightly more intuitive letter ‘Q’ for the quantity of transactions, and following this framework, we choose to disaggregate both sides of (1), on the one hand into money used for transactions that are part of GDP (called $M_R V_R$) and those that are not (called $M_F V_F$), and on the other hand the value of transactions that are part of GDP ($P_R Q_R$) which should be accurately proxied by nominal GDP ($P_R Y$), and those that are not ($P_F Q_F$):

\[
\begin{align*}
(5) \quad MV &= M_R V_R + M_F V_F \\
(6) \quad PQ &= P_R Q_R + P_F Q_F
\end{align*}
\]

At the same time, equations (7) and (8) must also hold:

\[
\begin{align*}
(7) \quad M_R V_R &= P_R Q_R \\
(8) \quad M_F V_F &= P_F Q_F
\end{align*}
\]

Since we defined $P_R Q_R$ as the value of all transactions contributing to GDP, the value of transactions that are part of GDP should be equal to nominal GDP ($P_R Y$):

\[
(7') \quad M_R V_R = P_R Y
\]

with $V_R = (P_R Y)/M_R = \text{const.}$

With a stable ‘real’ velocity of money, $V_R$, the effective amount of money used for GDP transactions during any period of time ($M_R V_R$) must be equal to nominal GDP. Meanwhile, the amount of money effectively used for non-GDP transactions will be equal to the value of these non-GDP transactions.

By definition, for economic growth to take place, the value of economic transactions during one time period must exceed that of the previous period of comparison. Considering therefore net changes in variables over the observed time period, we obtain:

\[
\begin{align*}
(9) \quad \Delta(M_R V_R) &= \Delta(P_R Y) \\
(10) \quad \Delta(M_F V_F) &= \Delta(P_F Q_F)
\end{align*}
\]

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We can say that the rise (fall) in the amount of money used for GDP-based transactions is equal to the rise (fall) in nominal GDP. Similarly equation (10) states that the rise (fall) in the amount of money used for non-GDP transactions is equal to the change in the value of non-GDP transactions. In other words, an asset bubble can be caused if more money is created and injected into asset markets.

In order to put figures into these equations we must now agree on how to measure money (or MV, the net amount of nominal money effectively used for all transactions). Fisher, Keynes and most post-war researchers used deposit aggregates ranging from M0 to M4 to represent M in the quantity equation. But there are a number of problems with this approach.

Firstly, the original equation of exchange defines M as the purchasing power that is actually exerted when transactions take place. The M-aggregates measuring the ‘money supply’ as traditionally defined, mainly consist of money deposited with banks or the central bank. They money that, at the moment of measurement, is not used for transactions. The original equation of exchange however demands a measure of that money which is used for transactions – money in circulation, not money out of circulation. Effectively, the M-measure that have dominated until now are not monetary aggregates, but savings aggregates.

John Stuart Mill (1848) was clear on this point, but subsequent authors have tended to neglect it. First he defines the quantity equation as a transactions equation, as described later by Fisher and by us above. He then points out that

“Whatever may be the quantity of money in the country, only that part of it will affect prices which goes into the market of commodities, and is there actually exchanged against goods. Whatever increases the amount of this portion of the money in the country, tends to raise prices. But money hoarded does not act on prices. Money kept in reserve by individuals to meet contingencies which do not occur, does not act on prices. The money in the coffers of the Bank, or retained as a reserve by private bankers, does not act on prices until drawn out, nor even then unless drawn out to be expended in commodities” (Book III, Chapter 8, par. 17, p. 20).

Secondly, defining money by certain private sector assets, such as deposits, creates the identification problem recognized by Friedman (1956) that “there is no hard-and-fast line between ‘money’ and other assets” (p. 65).

Thirdly, using the traditional definition of money as cash or deposits, it remains impossible to implement a disaggregation of the money by the use it is put to. As Friedman (1956) noted, “dollars of money are not distinguished according as they are said to be held for one or the other purpose” (p. 61).

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12 “The whole of the goods sold (counting each resale of the same goods as so much added to the goods) have been exchanged for the whole of the money, multiplied by the number of purchases made on the average by each piece. Consequently, the amount of goods and of transactions being the same, the value of money is inversely as its quantity multiplied by what is called the rapidity of circulation. And the quantity of money in circulation is equal to the money value of all the goods sold, divided by the number which expresses the rapidity of circulation” (Book III, Chapter 8, paragraph 13).
The correct definition of money for purposes of these equations is one that measures the money that actually circulates in the economy and is used for transactions at any moment in time, as Mill would have argued. It is an empirical question to find out what data conveys this information.

The issue can be reformulated: equation (9) defines nominal GDP growth ($P_{rY}$). Growth this year means that more transactions (that are part of GDP) have taken place this year than last year. We know that this is only possible if more money has also exchanged hands to pay for these transactions. The next question therefore is: how can the amount of money used for transactions increase in our modern financial system? If we had a pure gold standard – which is what most classical and many neoclassical theories were designed for – then the answer would be that either gold previously retired from circulation (savings) is spent and put into circulation, or more gold is discovered, extracted and injected into the economy. However, today no country is on a gold standard. Instead, we have a system of fiat money. There are many different ways of organising such a system and history is full of interesting case studies. How is money created and injected in our present-day system? This is a simple question that empirical research should quickly be able to answer. Intriguingly, virtually no research is published on this question at all in the leading journals of macroeconomics, monetary economics, or banking and finance. To be sure, they carry many articles that make assumptions about how a theoretical monetary system may be defined in the particular cases of their stylised models. This does not help us further though, if we are interested in reality.

The particular type of fiat money system that is currently employed world-wide is one in which about 97% of the money supply is created and allocated largely by private profit-oriented enterprises, namely the banks. How do banks create money? As Werner (1992, 1997, 2005) argues and as we show in Ryan-Collins et al. (2011), banks simply invent 97% of the money supply when they credit borrowers’ bank accounts with sums of money that nobody transferred into these accounts from other parts of the economy. To use another phrase: banks create money out of nothing when they extend bank credit (or purchase other assets, or pay their staff). This is why the process of granting bank loans is better described by the expression credit creation.

It is a simple point. So much so that J. K. Galbraith (1975) said of it:

“The process by which banks create money is so simple that the mind is repelled. When something so important is involved, a deeper mystery seems only decent” (p. 18f).

On the one hand the fact that banks create the money supply is a fact well known to a small group of experts. This is attested by many central bank publications,

13 Thanks to the banking crisis, this seems to be turning into the mainstream view, as articles by Martin Wolf in the FT signify: “…it is the normal monetary system, in which the “printing” of money is delegated to commercial banks, that needs defending. This delegates a core public function – the creation of money – to a private and often irresponsible commercial oligopoly.” (Wolf, 2012)
although mostly in obscure locations that have not attracted attention.\textsuperscript{14} It has also been recognized by Pollexfen (1697), Law (1720), Thornton (1802), John Stuart Mill (1848), Macleod (1855/56) and others (even though usually not formulated explicitly or precisely). But it failed to become the mainstream view, probably due to the fixation on legal tender or metallic money, and the subsequent focus on ‘M’-type deposit aggregates. Schumpeter (1954) points out that these authors recognized that in their economic effect money (traditionally measured) and bank credit could be identical:

"As soon as we realize that there is no essential difference between those forms of ‘paper credit’ that are used for paying and lending, and that demand, supported by ‘credit’, acts upon prices in essentially the same manner as does demand supported by legal tender, we are on the way toward a serviceable theory of the credit structure..."\textsuperscript{15}

The recognition that credit may have the same economic effect as money was a major breakthrough, because legally money and credit are quite different constructs. As Schumpeter pointed out:

“And this is why Thornton’s perception of the fact that the different means of payments may, on a certain level of abstraction, be treated as essentially alike was a major analytic performance, for the mere practitioner will in general be impressed by the technical differences rather than by the fundamental sameness.”\textsuperscript{16}

But despite these early insights and occasional bursts of research focusing on credit, its role has remained too small in mainstream theories, especially in the post-war era. According to Schumpeter,

“it proved extraordinarily difficult for economists to recognize that bank loans and bank investments do create deposits. In fact, throughout the period under survey they refused with practical unanimity to do so” (p. 1114).

Thus this fact has not been properly reflected in macroeconomic or monetary models. Yet, the fact that banks create the money supply can be utilized to answer our

\textsuperscript{14} By far the largest role in creating broad money is played by the banking sector ... When banks make loans they create additional deposits for those that have borrowed.” (Bank of England, 2007). “Money-creating organisations issue liabilities that are treated as media of exchange by others. The rest of the economy can be referred to as money holders (Bank of England, 2007). “... changes in the money stock primarily reflect developments in bank lending as new deposits are created” (Bank of England, 2007). “Given the near identity of deposits and bank lending, Money and Credit are often used almost inseparably, even interchangeably ...” (Bank of England, 2008). “Each and every time a bank makes a loan, new bank credit is created – new deposits – brand new money” (Graham Towers, 1939, former Governor of the Central Bank of Canada). “Over time ... Banknotes and commercial bank money became fully interchangeable payment media that customers could use according to their needs” (European Central Bank, 2000). “The actual process of money creation takes place primarily in banks” (Federal Reserve Bank of Chicago, 1961). “In the Eurosystem, money is primarily created through the extension of bank credit .... The commercial banks can create money themselves, the so-called giro money” (Bundesbank, 2009).

\textsuperscript{15} Schumpeter (1954), p. 718f.

\textsuperscript{16} Schumpeter (1954), p. 719, emphasis as in original.
research question at hand: In an economy with a banking system, the amount of money actually used for transactions can only increase when banks create new credit (Werner, 1992, 1997). This means that bank credit creation should have a direct impact on transaction volumes, demand, and hence also prices, as Mill (1848) and Bentham (1952-4) suggested.\textsuperscript{17}

In order to avoid confusion we should reflect these facts in our notation by replacing letter ‘M’ with ‘C’, for credit. Hence our equations become the Quantity Theory of Credit (as presented by Werner, 1992, 1997, 2005):

\begin{align}
(11) \quad CV &= PQ \\
(12) \quad CV &= CRV_R + CFV_F \\
(13) \quad PQ &= PRQ_R + PFQ_F \\
(14) \quad CRV_R &= PRQ_R \\
\end{align}

Since we defined \( PRQ_R \) as the value of all GDP-based transactions, we also know that the following equation holds, where \( PR \) stands for the GDP deflator and \( (PRY) \) stands for nominal GDP.

\begin{align}
(15) \quad CRV_R &= PRY \\
\text{with } V_R = (PRY)/CR &= \text{const.} \\
(16) \quad CFV_F &= PFQ_F \\
\text{with } V_F = (PFQ_F)/CF &= \text{const.} \\
\end{align}

For growth:

\begin{align}
(17) \quad \Delta(CRV_R) &= \Delta(PRY) \\
(18) \quad \Delta(CFV_F) &= \Delta(PFQ_F) \\
\end{align}

\textsuperscript{17} In Mill’s words, not dissimilar to the at the time unpublished Bentham: “This extension of credit by entries in a banker’s books, has all that superior efficiency in acting on prices, which we ascribed to an extension by means of bank notes…” p. 70. “Credit which is used to purchase commodities, affects prices in the same manner as money” (p. 71).
2.3 Solving Key Puzzles

Defining money

The simple model of disaggregated credit offers solutions to the puzzles and 'anomalies' that we have identified. Firstly, we find that the problems of the traditional approach in measuring the money supply can be addressed by employing the more accurate definition of money as credit created by the banking system (including the central bank).

(1) Credit creation measures only purchasing power that is actually used for transactions at the time of measurement – which is what the equation of exchange requires, and deposit aggregates cannot deliver. Credit always represents effective purchasing power, as borrowers take out loans to engage in transactions.

(2) There is no doubt about where credit creation starts or stops – thus accurate and clear-cut measures of the effective ‘money supply’, namely credit creation, can be found. To be clear, only the net creation of new transferable purchasing power is part of the definition. Thus what is often termed ‘credit’, for instance, the issuance of corporate debt or government bonds, does not in itself constitute credit creation, as in these cases already existing purchasing power is transferred between parties. Trade credit, if not underwritten by financial institutions, is not transferrable and generally usable (although it may still have economic effects, which require further research).

(3) Credit creation can be disaggregated, as we can obtain and analyse information about who obtains loans and what use they are put to. Sectoral loan data provide us with information about the direction of purchasing power - something deposit aggregates cannot tell us. By institutional analysis and the use of such disaggregated credit data it can be determined, at least approximately, what share of purchasing power is primarily spent on ‘real’ transactions that are part of GDP and which part is primarily used for financial transactions. Further, transactions contributing to GDP can be divided into ‘productive’ ones that have a lower risk, as they generate income streams to service them (they can thus be referred to as sustainable or productive), and those that do not increase productivity or the stock of goods and services. Data availability is dependant on central bank publication of such data. The identification of transactions that are part of GDP and those that are not is more straight-forward, simply following the NIA rules.

18 Proponents of the deposit view sometimes argue that it should not matter whether deposits or loans are being analysed, as both tend to be equal in the long run. This is not true, due to the main problems with deposit aggregates, including the problem of defining them. Werner (1996c) has shown that in the Japanese case, a broad credit measure and M2+CD, the traditional deposit measure, diverged greatly in the 1990s. While significant growth of M2+CD seemed to suggest an economic recovery in 1995, the credit aggregate suggested a contraction of nominal GDP growth - for the first time since 1931. The latter is what happened. Conversely, while M2+CD growth remained stable from mid-1995, the credit aggregate suggested a sudden economic recovery from the fourth quarter of 1995, which again materialised.
Explaining the velocity decline
The disaggregated model shows that the apparent velocity decline was due to the neglect of non-GDP transactions (financial transactions). A correct quantity equation, which is disaggregated at least into the two streams of GDP and non-GDP based transactions, should not suffer from a velocity decline. Empirical evidence for this has been offered in Werner (1997, 2005).19

Explaining what makes banks special
The approach places credit creation at its centre. The ability and license to create credit is the function of banks that sets them apart from other non-bank players in the economy. That banks ration and allocate credit is recognized in the literature. But this takes on a whole new dimension of importance when it is combined with the recognition that banks are the creators of the money supply. This is the missing link that causes credit rationing (Jaffee and Modigliani, 1969, Jaffee and Russell, 1976; Stiglitz and Weiss, 1981) to have macroeconomic implications (Werner, 1992, 1997). Since the credit market is rationed and determines the money supply, the quantity and the quality of credit creation are key factors shaping the economy. This explains why non-bank sources of funding can never compensate in aggregate for a lack of bank credit: neither non-bank financial institutions, nor debt and equity markets can create credit. There are many policy implications of this fact, some of which will be explored in the second part of this paper.

Explaining the ineffectiveness of interest rate reductions
The puzzle of why over a decade of interest rate reductions failed to stimulate the Japanese economy is solved by equation (15). Nominal GDP growth is determined by credit creation used for GDP-based transactions. Interest rates do not appear in equation (15). Further, an inspection of the link between credit growth and interest rates shows that there is not a robust negative correlation between the two (Werner, 2005). In other words, it is not surprising that lower interest rates may at times not stimulate the economy, if the key variable driving growth – credit for GDP-transactions – is not growing. Likewise, raising interest rates should not slow the economy, if credit creation for GDP transactions continues to grow.

Explaining why we experience recurring banking crises
Many empirical papers have found that banking crises follow a build-up of asset prices (e.g. Englund, 1999; Allen, 2001; Borio and Lowe, 2002; Reinhart and Rogoff, 2009). There has however not been a convincing reflection of this relationship in macroeconomic models (partly because banks do not usually feature). Equation (16) fills the gap and offers the simplest possible argument: asset inflation is caused by the creation of credit (and hence new money) by banks for asset transactions. This boosts asset prices, but their continued rise is predicated on continued credit creation for asset transactions. As soon as this is not forthcoming sufficiently, asset prices must be

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19 The very concept of velocity is also called into question by an empirical approach recognizing the reality of transaction settlement via the banking system. The original concept of velocity was based on the assumption of a gold standard and the idea that the number of times a quantity of gold circulates would increase the value of transactions that it can be used for. The mechanics are different in a modern, bank-based financial system where all non-cash transactions (close to 97% of all transaction values) are settled via the banking system. More on this elsewhere.
expected to fall, which will render speculators out of pocket and asset loans non-performing. Due to the modest capital cushion in banking, a mere 10% drop in the present value of the loan portfolio (e.g. due to non-performance) would tend to wipe out the majority of equity, rendering banks technically bankrupt (*banca rotta*), the banking system subject to either runs or avoidance in the inter-bank market – both of which leave banks unable to operate.

The fact that asset prices are in aggregate determined by bank credit creation yields another important insight: the extension of credit for non-GDP transactions, if large and sustained enough, will produce a Ponzi scheme, whereby early entrants (those buying those assets that are driven up by bank credit creation), have a chance to exit with profits, while the late entrants (usually the broader public, buying at close to the peak of an asset bubble, as the media comes to focus on the phenomenal profits made by earlier entrants) will lose. The reason why credit for non-GDP transactions must be a Ponzi scheme is that only GDP transactions – as national income accountants know – generate the value that can yield income streams to service and repay loans. Thus any gains made from selling assets that have risen constitute a zero-sum game, whereby they are merely transfers from the losers. Credit creation for non-GDP transactions is thus inherently unsustainable, and if large enough results in major bankruptcies, banking crises and massive resource misallocation.

Given these dangers of credit for non-GDP transactions it is reasonable to contemplate how to avoid asset inflation and banking crises, or consumer price inflation for that matter. It is commonly held among economists and the public that the process of money creation should be performed in a prudent manner. Since most commentators assume that this task is performed only by the central bank, bank credit growth and the decisions of banks as to who obtains the newly created money have often escaped attention. Once we recognize that banks are the creators of the bulk of the money supply, it stands to reason that some kind of responsibility goes with this privilege. Hence banks should monitor – ideally following specific rules – the quantity and quality of their credit creation.

According to equation (16), asset inflation and boom/bust cycles – and hence systemic banking crises – can be avoided if banks do not extend credit for asset transactions. It also follows from equation (15) that credit of the type that increases productivity or the amount of goods and services available in the economy is less likely to produce consumer price inflation than credit creation in the form of consumer loans. We can thus usefully distinguish between productive, speculative and consumptive credit creation and its monitoring can serve to predict and prevent undesirable outcomes caused by credit creation. This is a distinction that has been used in the German-language literature almost a hundred years ago, but even some mainstream economists have been aware of it.20 For details, see Werner (2005).

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20 “When banks loan money to finance productive and profitable endeavors, the loans are paid off rapidly and bank credit continues to be generally available.” “The excess credit which the Fed pumped into the economy spilled over into the stock market -- triggering a fantastic speculative boom.” Greenspan (1967).
Explaining the ineffectiveness of supply-side reforms

In Japan more than two decades of significant structural reform, deregulation, liberalization and privatization, have failed to stimulate the economy. Likewise, the structural reforms implemented in transition economies, or Greece under its debt restructuring, have not stimulated demand. This may surprise proponents of supply-side models (such as real business cycle or DSGE models). But it is easily explained in our framework, which includes a monetary sector that affects the real economy. According to equation (15), nominal GDP growth is restricted by credit creation for GDP transactions. Structural reforms may raise the potential growth rate, but if a lack of credit creation does not allow the demand side to expand, the economy will continue to grow below its potential. In this situation, the more the potential growth rate is raised through supply-side reforms, the greater the deflationary pressure would be. This seems to describe the situation in Japan well, as it is entering into the third decade of recession and deflationary pressures. It also throws a critical light on the recent argument by the World Bank (2012) that China requires structural reform to stimulate the economy and maintain high growth.

Explaining the success of the German and East Asian economic model

Economies that manage to focus credit creation on productive and sustainable use – i.e. not for consumption and asset transactions – are likely to achieve superior economic performance (high nominal GDP growth and low inflation, without asset price cycles and with financial system stability). As the World Bank (1993) indicated, and others have also found (Patrick, 1962; Wade, 1990; Werner, 2000a, b; Werner, 2003), at the heart of the East Asian economic miracle has been a process of guiding credit towards productive use and suppressing unproductive and unsustainable (hence systemically risky) use of credit.

In East Asia this was done through the monetary policy tool of ‘window guidance’ (see Werner, 1998, 2002, 2003, 2005). In the wake of the banking crisis, many governments have indeed reconsidered and embraced the idea that they need to intervene in banks’ credit allocation decisions (and the concept of direction of credit is now also discussed in the UK, for instance, by Lord Turner, 2011, in this issue).

However, this tool was not employed in post-war Germany. Yet the economy avoided boom-bust cycles and asset bubbles and achieved relatively high, non-inflationary growth. This raises the possibility that there is an alternative to the introduction of a system of ‘credit guidance’ by the central bank. It stands to reason that a similar result to direct intervention can be achieved by designing the structure of the banking sector such that a type of banks is dominant that generally takes little interest in lending for financial transactions. In Germany, banking is dominated by locally-headquartered, small banks that focus on lending to the productive SME sector (as opposed to financial speculators). There is much discussion about the lack of funding for SMEs in the UK. This should not surprise with a highly concentrated banking system where five banks account for over 90% of deposits. In Germany, about 70% of deposits are accounted for by over 1,000 locally-headquartered, small savings and cooperative banks (Sparkassen and Volksbanken).
We find that the framework can account for the anomalies identified. In addition, there is a growing body of empirical evidence in its support, which is reviewed in Werner (2012).

3 Policy Implications

3.1 How to prevent Banking Crises, and the Role of the ECB in the propagation of the crisis.

Equations (17) and (18) indicate that banking crises can be avoided if bank credit is mainly used for transactions that are part of GDP, ideally for investment purposes (‘productive credit creation’). Werner (2005) has suggested to do this either via regulation (the government or central bank imposing regulations on banks restricting credit creation for transactions that do not contribute to GDP), or via the design of the banking structure such that it is dominated by banks that tend not to engage in credit creation for non-GDP transactions (such as small, locally headquartered banks, including municipality-owned banks and credit unions, which account for about 70% of the banking market in Germany), as Werner (2011) has argued. The design of a resilient, sustainable financial architecture must thus incorporate a mechanism that either discourages the extension of bank credit for non-GDP transactions (via the design of the structure of the banking sector, as has been the case in Germany) or establish a macro-prudential supervision, for instance operated by the central bank, which restricts credit for non-GDP transactions (as operated in East Asian economies in the form of ‘window guidance’, itself a policy introduced from pre-1945 Germany, see Werner, 2002).

The framework is also useful for an analysis of the causes of the European crisis. Consider the case of Ireland: its economy has been presented as a model by the ECB in numerous speeches by senior ECB officials who have praised its policies of deregulation, liberalization and deregulation, and argued that these policies were the cause of its high economic growth. Ireland at the time had no fiscal or national debt problems. However, critics such as the author had pointed out as early as 2003 and 2004 that a significant asset bubble was about to be created by the ECB, followed by a major banking and economic crisis (Werner, 2003). Today we do not hear much from the ECB leadership about the structural and supply-side advantages of the deregulated Irish economy. Indeed, the massive depression in Ireland is easier to explain by the fact that credit creation is negative, with bank credit shrinking at double-digit pace, than with the attempt to explain it with a sudden loss of structural supply-side advantages. Likewise, the preceding Irish boom is easier explained with bank credit growth of about 20% year after year, indicating in application of our theory that credit had been created mainly for non-GDP, i.e. unsustainable asset
transactions, which will always turn non-performing, busting the banking system. When the latter happened, the ECB did not make the Irish government aware of the availability of zero-cost policy options to solve the crisis (discussed below). As a result, the Irish government felt compelled to guarantee the by then bloated banking system and its ballooned assets. This turned the Irish state from a model of fiscal virtue to near-default. Ireland called in the IMF and other international lenders to avoid bankruptcy.

The story is not much different in Spain, Portugal and Greece. Each time the fundamental cause of the current predicament was bank credit growth in excess of 20% for several years, creating property and financial bubbles that boosted also tax revenues to such an extent that governments kept expanding their budget forecasts. When the credit bubble ended, costs ballooned and tax revenues vanished. National bankruptcy loomed.

The question about causation and responsibility thus hinges on the question of who was responsible for the rapid expansion in bank credit creation. The answer is unambiguous. To monitor and contain bank credit creation in the eurozone is the core responsibility of the central bank – in Europe’s case that of the ECB and its national branches (the national central banks). In the vast majority of eurozone members the national central banks, which are a constituent part of the ECB, have even been functioning as the main bank regulators.

In my encounter with M Trichet in 2004 (cited in Werner, 2005) I questioned him about the quantity of credit creation in the eurozone. His response was to feign ignorance. “Credit creation? I don’t know what you mean.” Indeed, the ECB argues that it did not watch bank credit growth, and that it was not even concerned with national-level inflation data, but was merely watching European-wide inflation data to determine its policy. But claiming ignorance or incompetence does not absolve the ECB from responsibility.

This analysis calls into question the wisdom of granting such vast powers to independent and unaccountable institutions such as the ECB or the proposed ESM, with similar powers and legal immunity. I argued in 2003 (Werner, 2003) that the excessive independence of the ECB – essentially the revived Reichsbank, not the continuation of the Bundesbank – is likely to result in credit boom-bust cycles. I was hoping the ECB would prove me wrong, but it wasted no time in implementing its misguided policies.

3.2 How to Render Fiscal Policy Effective

What are the implications of the refined quantity equation, as presented above, for the role and impact of fiscal policy? Consider equation (17), rewritten with constant velocity:

\[ (17^{'}) \quad \Delta(P_\mathbb{R}Y) = V_\mathbb{R}\Delta C_\mathbb{R} \]
Any exogenous increase in a component of nominal GDP (such as nominal government expenditure $g$) cannot affect total nominal GDP, if credit creation for GDP transactions ($\Delta C_R$) remains unaltered: assuming $\Delta C_R = 0$, and breaking down nominal GDP ($P_R Y$) into nominal consumption $c$, nominal government expenditure $g$, nominal investment $i$ and nominal net exports $nx$, we obtain:

$$\Delta C_R = 0$$

$$\Delta (P_R Y) = \Delta c + \Delta i + \Delta g + \Delta nx$$

$$\Delta g = - (\Delta c + \Delta i + \Delta nx)$$

Equation (22) indicates that the change in government expenditure $\Delta g$ is countered by a change in private sector expenditure of equal size and opposite sign, as long as credit creation remains unaltered. In this framework, just as proposed in classical economics and by the early quantity theory literature, fiscal policy cannot affect nominal GDP growth, if it is not linked to the monetary side of the economy: an increase in credit creation is necessary (and sufficient) for nominal growth.

In the general formulation of the model, with variable $\Delta C_R$ we find, substituting (21) into equation (17‘):

$$\Delta (c + i + nx) = V\Delta C_R - \Delta g$$

whereby the coefficient for $\Delta g$ is expected to be close to $-1$. In other words, given the amount of credit creation produced by the banking system and the central bank, an autonomous increase in government expenditure $g$ must result in an equal reduction in private demand. If the government issues bonds to fund fiscal expenditure, private sector investors (such as life insurance companies) that purchase the bonds must withdraw purchasing power elsewhere from the economy. The same applies (more visibly) to tax-financed government spending. With unchanged credit creation, every yen in additional government spending reduces private sector activity by one yen.

Notice that this conclusion is not dependent on the classical assumption of full employment. Instead of the employment constraint that was deployed by classical or monetarist economists, we observe that the economy can be held back by a lack of credit creation (see above). Fiscal policy can crowd out private demand even when there is less than full employment. Furthermore, our finding is in line with Fisher’s and Friedman’s argument that such crowding out does not occur via higher interest rates (which do not appear in our model). It is quantity crowding out due to a lack of money used for transactions (credit creation). Thus record fiscal stimulation in the Japan of the 1990s failed to trigger a significant or lasting recovery, while interest rates continued to decline.

Put simply, for unchanged credit creation (which determines the size of the income pie), an increase in government expenditure amounts to an increase in the government share of the same income pie – and hence implies a reduction in the private sector share. As Milton Friedman put it:
“The quantity theory implies that the effect of government deficits or surpluses depends critically on how they are financed. If a deficit is financed by borrowing from the public without an increase in the quantity of money, the direct expansionary effect of the excess of government spending over receipts will be offset to some extent, and possibly to a very great extent, by the indirect contractionary effect of the transfer of funds to the government through borrowing. ... If a deficit is financed by printing money, there will be no offset, and the enlarged stock of money will continue to exert an effect after the deficit is terminated. What matters most is the behavior of the stock of money, and government deficits are expansionary primarily if they serve as the means of increasing the stock of money; other means of increasing the stock of money will have closely similar effects.”

Werner (2005, 2012) provides empirical evidence from Japan: the sizeable fiscal stimulation occurring in Japan during the 1990s failed to trigger a lasting economic recovery, because it was not backed by credit creation.

Policy-makers that wish to stimulate growth can do so by increasing credit creation. There are a number of options available. One is via fiscal policy that is funded by credit creation or other measures that increase credit creation (as Werner, 1995, suggested in Japan, referring to this as ‘quantitative easing’ – an expression which was later borrowed by central banks to refer mainly to conventional monetarist bank reserve or high powered money expansion – for which many expressions already existed). As Blinder and Solow (1973:323) pointed out, there “is no controversy over government spending financed by printing money. ... it will be expansionary”. The lack of incentives to coordinate monetary policy with the government’s fiscal policy may be one of the disadvantages of central bank independence.

A More Effective Way to Monetise Fiscal Policy

There is a policy for governments to monetise fiscal policy even without cooperation from the central bank. The method, first suggested by Werner (1996, 1998, 2000a, 2000b) renders fiscal policy effective, according to the above model. The Ministry of Finance could cover the public sector borrowing requirement by substituting bond finance with borrowing from the private sector commercial banks.

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22 I argued in the Nikkei (Werner, 1995) that a new type of monetary policy was necessary that did not focus on the price of money, but on its quantity. That quantity is credit creation. Since I did not want to be confused with monetarist proposals - and in fact warned that boosting bank reserves or high powered money, for instance via open market purchases from the banks was also doomed to fail - I needed a new expression for this, especially since in the Japanese language the expression ‘credit creation’ used to be little understood. I thus added the word ‘quantitative’ to the standard expression of stimulatory monetary policy (‘monetary easing’), short ‘quantitative easing’. Having denied that my proposal to expand credit creation would work, the Bank of Japan then switched from its failed interest policy to the older, and also failed monetarist policy of expanding bank reserves - but had the nerve to call this ‘quantitative easing’.

23 Independence is not necessarily an obstacle, since a central bank can voluntarily cooperate to support the government’s policy. As Bernanke (2000) pointed out, “Cooperation with the fiscal authorities in pursuit of a common goal is not the same as subservience” (p. 163). Unfortunately, there are few examples of such cooperation by independent central banks.
This would increase credit creation and, according to the above model, stimulate the economy.

Thus funding of fiscal expenditure by borrowing from banks would increase credit creation and hence the total amount of purchasing power in the economy. As a result, $\Delta C_R$ in equation (17') above would rise, which would, in turn, boost nominal GDP. By shifting government funding away from bond finance and replacing it with borrowing from the commercial banks via simple loan contracts, credit creation will be stimulated. Unlike bond markets, banks create new purchasing power when they lend. This means that overall economic activity can be boosted (via fiscal policy), without any quantity crowding out that rendered fiscal policy ineffective during the 1990s.

Figures 1 and 2 are used to illustrate the difference between stimulatory fiscal policy – here the example of a fiscal spending package – funded via bond issuance taken up by investors, such as life insurers, and stimulatory fiscal policy that is backed by credit creation.

**Figure 1. Standard fiscal policy, funded via bond issuance.**

24 This is effectively the policy combination adopted by the Reichsbank from 1933 to 1937. Its President, Hjalmar Schacht, appeared to have been well aware of the quantity crowding out problem of unmonetised fiscal policy. In addition to stepping up the credit creation of the Reichsbank (by purchasing various forms of assets, including government bonds and bonds of other government institutions), Schacht instructed the establishment of government institutions that implemented fiscal spending programmes and were funded by the issuance of bills of exchange that were purchased by the banks and the central bank. Funding fiscal expenditure with money creation, as opposed to public bond auctions is called ‘silent funding’ (geräuschlose Finanzierung) in the German tradition.

25 The Werner (1996, 1998) proposal is supported and seconded by economists such as Congdon (2001), Smithers (2001) and the Financial Times’ Martin Wolf (2002), although they fail to cite it.
Although the central government funded parts of the 1998 budget from banks, this has remained negligible in size. With the majority of bond issuance taken up by the non-bank private sector (which does not have the power to create credit), fiscal spending had to crowd out private activity.

Germany in 1968, under finance minister Karl Schiller, funded about 70% of the public sector borrowing requirement (amounting to DM13bn) through long-term borrowing from private banks. More recently, such as in 1999, Germany funded its public sector borrowing requirement (amounting to €35bn, approx. DM70bn), entirely through the issuance of government bonds, and, additionally, reduced its borrowing from financial institutions (by a net €10bn, approx. DM20bn). The model seems consistent with such evidence and the observation that fiscal policy in the late 1960s seemed more effective and fiscal multipliers were larger, than in the late 1990s or presently. It provides an explanation for this puzzle of declining fiscal multipliers.

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26 I am grateful to Mr Wolfgang Eichmann, Head of Section III of the German Federal Statistical Office, for kindly writing to me, upon reading some of my work, and pointing out these supportive facts from Germany to me. See also Eichmann’s (2002) relevant article on the velocity of money, which, among others, cites Werner (1997).
3.3 How to solve the European sovereign debt crisis

A main drawback of the recent policies to tackle the European sovereign debt crisis has been that none addresses the central problem of falling growth in the periphery. What is required is a policy that not only shields the government borrowing of the Eurozone government from adverse market movements (such as rising yields due to speculative attacks or downgrades by rating agencies), but more importantly one that stimulates economic growth in the eurozone.

Politicians and market participants have proposed that the ECB should purchase European government bonds. This may be based on the understanding that the central bank is the principal creator of the money supply. However, central banks only create about 3% of the money supply in most economies. The vast majority is created and allocated by private-sector profit-oriented enterprises, the commercial banks. It is thus more logical to ask the banks to help fund government expenditure. Applying the Werner (1996, 1998, 2000) proposal to the eurozone, we find that governments can stabilise their borrowing costs and stimulate domestic demand by a de-securitisation of their funding operations: instead of issuing government bonds, a superior policy would be to borrow the public sector borrowing requirement from the commercial banks in their respective country (Siekmann and Werner, 2011). For instance, they can enter into 3-year loan contracts at the prime rate (which as of November 2011 was lower than the longer dated bond yields for all affected periphery countries). The prime rate is closer to the banks’ refinancing costs of 1%.

The immediate savings would be substantial, as this method of enhanced debt management reduces the new borrowing costs. Instead of governments injecting money into banks, banks would give money to governments. This helps the banking sector, as its core business, to extend credit, is expanded, thus increasing retained earnings. These can then be used by banks to shore up their capital. There are substantial savings to the taxpayer as new bank rescues become largely unnecessary. Bank credit to the government will not be forced (as is forbidden in the EU treaties) but on a voluntary basis, at the prime rate. Eurozone governments remain zero risk borrowers according to the Basel capital adequacy framework (banks are thus happy to lend).

Finally, this proposal addresses the core underlying problem: slowing growth and the need to stimulate it. From the credit model we know that the proposal will boost nominal GDP growth – and avoid crowding out from the bond markets. This is especially a problem as fiscal policy has tightened in the eurozone, and monetary policy is de facto also tight: bank credit is slowing down sharply, and recently has turned to contraction in many eurozone countries, including Germany and the periphery. Bank credit extension is credit creation, adding to the money supply. From the credit model we know that the proposal will boost nominal GDP growth – and avoid crowding out from the bond markets. This increases employment and tax revenues. It can push countries back from the brink of a deflationary and contractionary downward spiral into an upward cycle of growth, greater tax revenues and falling debt/GDP.
Would banks be willing to lend to governments?

Their main business is the credit business, but this has taken a sharp dip in the past 3 years. Banks have become risk-averse and are only willing to lend to the lowest risk borrowers. This is the government, able to command in theory even lower rates than the private sector prime rate. The Basel capital adequacy framework reflects this reality. This is also true for periphery countries: banks’ solvency is ultimately guaranteed by governments, not the other way round. Thus lending to their governments, when undertaken as part of this plan, cannot hurt the banks. To the contrary, it will improve banks’s P&L and balance sheets, as well as the fiscal situation of the governments concerned, directly and indirectly, as economic growth will be boosted.

The European Central Bank’s Long-Term Refinance Operation (LTRO), announced on 8 December 2011, offered banks unlimited funding at a fixed interest rate of 1%, while formalizing that all bank lending is eligible as collateral for central bank funding. By February 2012, over 1 trn Euro in LTRO funding were borrowed by banks. However, much of this money is put into deposit with the ECB system. This policy on its own is thus not likely to be sufficient to accelerate bank credit creation. One problem is that banks are required to mark to market any securities holdings, thus limiting the appeal of investing in periphery government bonds. What is needed is an increase in the supply of bank credit.

After the ECB has replaced the market-based funding of banks via the interbank market with its direct lending programme, governments now need to match this policy by replacing the market-based government funding via the bond market with a direct government borrowing programme via loan contracts from the commercial banks.

This policy would boost domestic demand in the countries that adopt it, as bank credit creation would accelerate, in line with equation (17).

3.4 Towards a New, Sustainable Financial Architecture

Based on the above framework, the following framework for monetary and banking policy is proposed, which can largely be adopted by the ECB, and which will go a long way towards ensuring stable and sustainable growth without major boom-bust cycles and banking crises. Since the ECB has complete legal independence not only in the choice of policies, but also the choice of targets and instruments, there are no legal obstacles to their implementation.

1. Cancelling the bad debts in the banking system without new costs

The ECB should purchase all non-performing assets from all Eurozone banks at face value, in exchange for banks agreeing to comply with a new ‘credit guidance regime’ run by the ECB. This is the most cost-effective way to end the banking crisis (triggered by a monetary policy that allowed banks to expand credit for financial circulation, often growing by 30% or more in Ireland, Spain, Greece and Portugal), as no tax money is required and national debts or obligations of member states do not rise. It is thus preferable to the debt-based proposals that are currently being implemented (via the EFSF or ESM or national budgets).
Sometimes a counterargument is formulated that it should not be possible to solve the bad debt crisis in this way without incurring costs (see the comment by Jörg Asmussen on this proposal in a public debate in Berlin on 18 June 2012, with Daniel Gros and Richard Werner as co-discussants). The fact is that the costs of the banking problem are of course not zero: the costs of the significant resource-misallocation during the asset boom phase (during the operation of the Ponzi scheme) are substantial; the costs of the bursting of the bubble (the end of the Ponzi scheme) are substantial, as firms and individuals go bankrupt, as unemployment rises, as fiscal revenues decline and public services are cut back. The present proposal however ensures that no further unnecessary costs are added to these existing and unavoidable costs of the prior misguided monetary policy. Burdening the tax payer with the costs of a bank bail-out, when this is not necessary, must constitute a phenomenal waste of economic resources.

2. Preventing the recurrence of banking crises and resource misallocation due to asset boom-bust cycles

The ECB should introduce and operate a new ‘credit guidance’ regime, whereby the ECB via its national central banks (NCBs) requires banks to meet monthly and quarterly quotas concerning the growth of total credit outstanding AND the credit outstanding in each of the sub-categories of credit, on which banks have to report on a monthly basis as well, namely:

A. bank credit for GDP transactions, divided into
   • mortgage credit to households
   • consumer credit
   • other credit to individuals
   • credit to the manufacturing industry (divided into further specific industries, though no sub-targets set)
   • credit to the construction sector
   • credit to the non-financial service sector (divided further into specific industries)
   • R&D, education
   • other categories

B. bank credit for non-GDP transactions, divided into
   - credit to other banks
   - credit to non-bank financial institutions
   - credit to financial or property holding companies
   - other categories

whereby the ECB via its NCBs restricts credit to type B sectors and sets positive YoY% growth targets for credit of type A.

3. Kickstarting economic demand (and tax revenues) by expanding credit creation

The ECB should institute a loan guarantee scheme for the most desirable types of loans, i.e. to the manufacturing sector implementing new technology, to the environmentally enhancing and sustainable energy producing sector, as well as in R&D and education. Loans are guaranteed by the ECB. Secondly, until above credit
guidance schemes are fully operational, the ECB, via its NCBs introduces a new direct lending facility whereby the NCBs extend credit to type A sector borrowers.

4. **Ensuring a steady supply of credit creation for productive purposes by improving monetary policy tools**

The ECB should immediately re-introduce the Bundesbank’s bill rediscounting operations, expanded to all NCBs and extended to firms in type A sectors, but Eurozone-wide, via the NCBs. This was a successful monetary policy tool, as old as modern central banking, which ensured that ‘real bills’, i.e. debt instruments linked to real sector economic activity, would be backed by credit creation, while financial credit was discouraged. Until its abolition in 2001, this mechanism contributed towards the close to 10% credit growth in Germany. When the ECB abolished the practice, credit growth in Germany experienced a secular shock, reducing the growth rate to the range between −1 and +2%, thereby reducing economic growth in Germany during the following decade.

5. **Increasing the effectiveness of fiscal policy**

The ECB should introduce a new scheme, whereby the ECB and NCBs meet with the national finance/treasury ministries and debt management offices in order to end the issuance of government bonds in the markets and instead fund all public sector borrowing requirements (that must meet unchanged Brussels budgetary requirements) through direct loan contracts from the national banks. As discussed above, this reduces borrowing costs sharply, as the prime rate is lower, helps banks as their business expands without further capital adequacy requirements (risk weights are zero), while the loans do not need to be marked to market, but can be used for ECB refinancing. (as discussed in greater detail above).

6. **Counter-cyclical regulatory requirements**

The ECB should meet with national bank regulators, the European Banking Authority and the BCBS in order to negotiate release of eurozone banks from the Basel capital adequacy standards for the coming three years, until bank credit growth and hence nominal GDP growth is back to full employment levels.

The implementation of these policies, most of which can be adopted immediately by the ECB without the need for any legislative changes, would ensure the quickest possible return to the path of high and sustainable economic growth without major boom-bust cycles.

4 **Conclusions**

Banking crises and the asset bubbles that precede them are avoidable, if the right financial and monetary policy architecture is implemented – namely one that discourages the creation of credit for transactions that do not contribute to GDP (financial and asset transactions). This can be done via regimes of ‘credit guidance’
or, as shown in Germany, the design of the banking sector architecture: One of the implications for a country like Germany is that the particular structure of the banking sector, centred on not-for-profit, locally based banks (Sparkassen, Volksbanken), has been able to deliver stable growth without asset bubbles and banking crisis for a long time period, largely because the dominant banks have an inherent interest in lending to small, local borrowers, who are less likely to engage in financial speculation of the type that has fuelled financial credit in countries such as the UK, Iceland, Ireland, Spain, Portugal or Greece. Ironically, this German-style banking structure has been subject to much criticism from mainstream economic and financial analysts – but as we now know, on the basis of models that have failed. Our framework thus underlines the importance of maintaining and furthering the German-style financial architecture, even within a new framework for European or global financial architecture.

It is notable that the proposed course of action would not require the socialization of national debts through Eurobonds or other measures to further centralize authority and decision-making powers in Europe. The problems concerning the incentive structure that Eurobonds would create could thus be avoided. On the other hand, the proposal would make exit from the eurozone also unnecessary.

While this paper has emphasized the European perspective, the same mechanisms can be introduced on a global scale – by the relevant monetary authorities (whether in national settings or the setting of a currency union). Further research is however necessary for certain aspects of the global financial architecture and the implications of credit creation, such as the best ways to avoid debts among developing countries and ensuring that they are able to catch up with the industrialized countries effectively. Here it is merely noted that the IMF seems already aware of the role of credit creation on an international scale, as its lending conditionality is usually framed in quantitative and qualitative targets for credit creation.
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