Betreff: **Die Irrlehren der Wirtschaftswissenschaften**

Sehr geehrte/r Herr/Frau … !

Seit dem Ausbruch der größten Finanzkrise der Geschichte im Jahre 2007 stehen die Wirtschaftswissenschaften und Ihre Experten - egal ob als Lehrende an den Universitäten, in Wirtschaftsforschungsinstituten und anderen Organisationen, wie z.B. dem IWF, der OECD usw. völlig zu Recht unter großer Kritik, weil sie diese Krise und die folgende tiefe Rezession von 2009 nicht vorhergesehen haben.

► Auf die Frage der Queen, warum denn niemand die Krise habe kommen sehen, antwortete die British Academy im Juli 2009: "So in summary, Your Majesty, the failure to foresee the timing, the extent and the severity of the crises, and to head it off, while it had many causes, was principally a failure of the collective imagination of many bright people, both in those country and international, to understand the risks and the system as a whole." <http://www.economics-ejournal.org/datasets/dp2010-18_revised_verison.pdf>

► Fehlt den Ökonomen für diese Krise das theoretische Modell?
Das fragte die Frankfurter Allgemeine Zeitung (FAZ) den deutschen Wirtschaftsweisen, Univ.Prof. Dr. Peter Bofinger, am 16. Mai 2009 und er antwortete darauf: "Wir haben sehr ausdifferenzierte makroökonomische Modelle, sie haben nur einen Nachteil: Es gibt keinen Finanzsektor! Das finde ich bemerkenswert, insbesondere in der EZB: auch deren sehr kompliziertes Modell kennt keinen Finanzsektor. Man nimmt an, jeder Mensch hat alle Informationen, die er braucht, es gibt keine Unsicherheit. Dann ist Geld irrelevant, und den Finanzsektor kann man wegignorieren, weil er perfekt rational arbeitet." <http://www.faz.net/aktuell/wirtschaft/konjunktur/wirtschaftsweiser-peter-bofinger-grosse-staaten-haben-breite-schultern-1799868.html?printPagedArticle=true>

Diese Offenbarungen liefern einerseits eine Erklärung, wieso (fast) alle Experten von der extremen Wucht der Finanzkrise "total überrascht" waren. Andererseits sind sie ein Beweis dafür, wie gering die Expertise der Ökonomen zum bestehenden Banken- und Finanzsystem ist.

► Banken erfinden das "Geld aus dem Nichts"
Im Quarterly Bulletin 2014/1 zertrümmerte die Bank of England die weitverbreiteten nebulösen Thesen der Wirtschaftswissenschaften zur Funktionsweise von Banken: "Money creation in practice differs from some popular misconceptions [...] banks do not act simply as intermediaries, lending out deposits that savers place with them [...] but how those bank deposits are created is often misunderstood: the principal way is through commercial banks making loans! Whenever a bank makes a loan, it simultaneously creates a matching deposit in the borrowers bank account, thereby creating new money." <http://www.bankofengland.co.uk/publications/Pages/quarterlybulletin/2014/qb14q1.aspx>

► Nur wenige Tage nach der Veröffentlichung der Bank of England ging die Financial Times mit der Headline „Strip private Banks of their power to create money!“ an die Öffentlichkeit. Martin Wolf, Chefökonom und Mitherausgeber, forderte in aller Deutlichkeit die rechtliche Richtigstellung der Geldschöpfung: „The giant hole at the heart of our market economies needs to be plugged. Printing counterfeit banknotes is illegal – but creating private money is not. The inderdependance between the state and the businesses that can do this is the source of much of the instability of our economies. It could - and should - be terminated.“ <http://www.ft.com/intl/cms/s/0/7f000b18-ca44-11e3-bb92-00144feabdc0.html?siteedition=intl#axzz2zX9Myt5t>

Dies ist nur ein kleiner Auszug zum Diskurs in der Sache. Wie geht die Wissenschaft mit all dem um?

Nach der Erkenntnis- und Wissenschaftstheorie von Sir Karl Popper sind "wissenschaftliche Verallgemeinerungen von Beobachtungen als Theoriegebäude" genauso wie "populistischen Meinungen und Spekulationen" abzulehnen - vielmehr sind diese "vagen, nicht validen Spekulationen" durch das von ihm propagierte empirische Falsifikationsprinzip zu ersetzen. Seit damals ist die empirische Evidenz als Falsifikation (Widerlegung) zuvor aufgestellter Theorien die Basis der wissenschaftlichen Erkenntnisgewinnung und -überprüfung.

Nach der unmissverständlichen Veröffentlichung der Bank of England zur Funktionsweise von Banken und zwei richtungsweisenden Studien von Univ.Prof. Dr. Richard Werner, Universität Southampton, die die Teilreserve- und Finanzintermediär-Theorie empirisch falsifizierten (siehe Beilagen), hätten nicht nur wir erwartet, dass diese nun widerlegten Thesen, aus dem wissenschaftlichen Diskurs und aus der Lehre verschwinden. Leider ist das nicht der Fall!
Der unerfreuliche Sachverhalt, dass Theorien, die falsifizierte, nicht den buchhalterischen und ökonomischen Tatsachen entsprechen, weiterhin an Universitäten gelehrt werden, war der Grund unseres offenen Briefes an die Rektorin der Wirtschaftsuniversität Wien. Frau Univ.Prof. Dr. Hanappi-Egger war so freundlich, uns umgehend zu antworten. Sie finden unseren offenen Brief ebenso wie die Antwort der Rektorin in den Beilagen dieser Mail.

Unserer Meinung nach bedarf es einer öffentlichen und vielmehr noch einer umfassenden wissenschaftlichen Debatte darüber, welche Theorien an Universitäten gelehrt werden – und welche als falsifizierte Thesen aus den Lehrplänen entfernt werden sollen.

Was ist Ihre Meinung dazu?
Wir würden uns sehr freuen, wenn Sie uns Ihre geschätzte Sichtweise zu diesem Thema ca. bis Ende Mai zukommen lassen. Wir werden diese vollinhaltlich unserer Antwort an die Rektorin der Wirtschaftsuniversität Wien beifügen. Vielleicht können Sie in Ihrer Antwort auf die zwei elementaren Fragen näher eingehen:
* Wie erklären Sie es sich, dass die Wirtschaftswissenschaften im Zuge der aktuellen Finanzkrise einerseits ihre Modelle und Theorien nicht viel kritischer hinterfragt und andererseits nicht einmal den Regeln der Erkenntnistheorie folgt und dementsprechend eindeutig falsifizierte Theorien aus ihrer Lehre entfernt?
* Wie kann es sein, dass etwas, was die Politik für systemrelevant (und für "too big to fail") erklärt hat – nämlich Banken, in den Modellen der Wirtschaftswissenschaften gar nicht vorkommt?

Wir danken Ihnen im Voraus für Ihr Interesse und Ihre Unterstützung, mehr Licht ins Dunkel der Wirtschaftswissenschaft zu bringen.

Mit freundlichen Grüßen,

der Vorstand des KOV Kreditopfervereins:
Isabella Heydarfadai
Joya Marschnig
Reinhold Mannsberger
Rudolf Sommer
–

Banken in die Schranken!
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WIRTSCHAFTS
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KOV Kreditopferverein
Burggase 120/12
1070 Wien

Wien, 02.03.2016

Stellungnahme Offener Brief vom 23.02.2016

Was lehrt die WU Wien derzeit betreffend der Funktionsweise von Banken?

Die zwei wichtigsten Vorlesungen im Bereich der an der WU angebotenen Masterstudien zum Thema Banken sind (zu den Detailinhalten siehe die betreffenden Einträge im Vorlesungsverzeichnis):

„Kurs 1 – Banking: Risikomessung und Steuerung", Assoz.-Prof. Dr. Rainer Jankowitsch

http://vvz.wu.ac.at/cgi-bin/vvz.pl?C=L;I=0830;LV=3;L2=S;L3=S;S=15W;LANG=DE

sowie

"Money, Credit and Finance", ao. Prof. Dr. Guido Schäfer, Dr. Aurel Schubert

http://vvz.wu.ac.at/cgi-bin/vvz.pl?C=L;I=1363;LV=3;L2=S;L3=S;S=15W;LANG=DE

Wie beurteilt die WU Wien den Inhalt und die Implikationen der Studien von Prof. Werner?

Es ist nicht die Aufgabe der Leitung der WU, einzelne Publikationen WU-fremder Autor/inn/en zu beurteilen. Es steht den Wissenschafter/inne/n an der WU im Rahmen ihrer wissenschaftlichen Freiheit frei, bestimmte Forschungsergebnisse aufzugreifen oder zu beurteilen.

Wurden die genannten Studien von Prof. Werner von der WU bereits aufgegriffen und die Lehrinhalte entsprechend korrigiert?

Auch das liegt im Verantwortungsbereich der entsprechenden habilitierten Lehrveranstaltungsleiter/innen und nicht bei der Leitung der WU. Wir weisen aber dennoch darauf hin, dass nicht automatisch jedes weltweit publiziertes Forschungsergebnis umgehend zu einer Korrektur der Lehrinhalte führt. Es ist vielmehr Aufgabe des akademischen Diskurses in der jeweiligen wissenschaftlichen Community, neue Ideen und Ergebnisse kritisch zu diskutieren und den Wissenstand des Faches gegebenenfalls zu erweitern. Wenn die von Ihnen vorgelegten Artikel den kritischen Qualitätssicherungsprozess der betreffenden wissenschaftlichen Community erfolgreich durchlaufen haben, ist davon auszugehen, dass sich das auch in den Lehrinhalten niederschlagen wird.

REKTORIN
RECTOR

UNIV.PROF. DR. EDELTRAUD HANAPPI-EGGER
T +43-1-313 36-4700, F +43-1-313 36-904700
Welthandelsplatz 1, Building AD, 1020 Vienna, Austria
edeltraud.hanappi-egger@wu.ac.at, www.wu.ac.at

Lassen sich zwischen der heutigen Finanzkrise und den bisherigen Irrlehren der Wirtschaftswissenschaften Zusammenhänge herstellen – und wenn ja, gibt es Strategien zur Behebung dieser Fehler?

Die Fachvertreter/innen in den Fächern Volkswirtschaftslehre und Finanzwirtschaft an der WU (aber auch teilweise in anderen Fächern) beschäftigen sich intensiv mit vielfältigen Fragestellungen zu Ursache der Finanzkrise und auch zur Diskussion möglicher Strategien zu Verhinderung neuer Krisen (siehe die persönlichen Publikationslisten der betreffenden Forscher/innen). Jede Wissenschaftsdisziplin ist innerhalb des oben beschriebenen kritischen Diskurses einem stetigen Änderungsprozess unterworfen, in dem immer wieder neue Erkenntnisse gewonnen werden und alte Theorien verworfen werden.

Wann wird die WU Wien die Lehrbücher mit falsifizierten Theorien entsorgen?

Die WU Wien hat sich in ihrem Bibliothekskonzept zum Ziel gesetzt, der studentischen Nachfrage entsprechend alle wichtigen Lehrbücher in entsprechender Stückzahl anzukaufen, wenn diese von den im Rahmen ihrer Lehrbefugnis verantwortlichen Universitätslehrer/inne/n empfohlen werden. Im Sinne eines internationalen Standards folgenden Bibliothekswesens werden nicht mehr empfohlene Lehrbücher nicht unmittelbar entsorgt, sondern entsprechend aufbewahrt, um zukünftiger Forschung weiterhin zur Verfügung zu stehen.

Wann wir die WU Wien die Vorlesungsinhalte entsprechend den Erkenntnissen von Prof. Werner korrigieren?

Es gilt auch hier das oben gesagte. Vorlesungsinhalte werden von den verantwortlichen Lehrveranstaltungsleiter/inne/n laufend dem jeweiligen Entwicklungsstand des betreffenden Faches entsprechend angepasst.

Mit freundlichen Grüßen

Edeltraud Hanappi-Egger

KOV Kreditopferverein
ZVR-Zahl 367670055

Burggasse 120/12, 1070 Wien
office-oesterreich@kreditopferhilfe.net
www.kreditopferhilfe.net

Banken in die Schranken!

Rektorin Wirtschaftuniversität Wien
Frau Dr. Edeltraud Hanappi-Egger
Welthandelsplatz 1
1020 Wien

Wien, 23.02.2016

O F F E N E R B R I E F

Betrifft: **Lehre der Wirtschaftsuniversität betreffend der Funktionsweise von Banken**

Sehr geehrte Frau Rektorin Dr. Hanappi-Egger!

Seit den Studien „Can banks individually create money out of nothing? – The theories and the empirical evidence“ und „A lost century in economics: Three theories of banking and the conclusive evidence“ von Prof. Richard Werner (derzeit tätig an der Universität von Southampton) sind die Teilreserve-Theorie und die Finanzintermediär-Theorie zur Funktionsweise von Banken empirisch falsifiziert.

Wie Sie bestimmt zugestehen werden, kommt in einer Welt, in der bisweilen ganze Staaten von Banken in Geiselhaft genommen werden (siehe Griechenland), dem korrekten Verständnis der Funktionsweise von Banken fundamentale Bedeutung zu. Die Lehre und die Wissenschaft tragen hier also höchste gesellschaftliche Verantwortung!

Aus diesem Grund fordern wir Sie auf, in einer Stellungnahme nachfolgende Fragen zu beantworten:
- Was lehrt die WU Wien derzeit betreffend der Funktionsweise von Banken?
- Wie beurteilt die WU Wien den Inhalt und die Implikationen der Studien von Prof. Werner?
- Wurden die genannten Studien von Prof. Werner von der WU Wien bereits aufgegriffen und die Lehrinhalte dementsprechend korrigiert?
- Lassen sich zwischen der heutigen Finanzkrise und den bisherigen Irrlehren der Wirtschaftswissenschaften Zusammenhänge herstellen – und wenn ja, gibt es Strategien zur Behebung dieser Fehler?

Falls die Lehrinhalte noch nicht korrigiert wurden:
- Wann wird die WU Wien die Lehrbücher mit falsifizierten Theorien entsorgen?
- Wann wird die WU Wien die Vorlesungsinhalte entsprechend den Erkenntnissen von Prof. Werner korrigieren?

Für Ihre geschätzte Stellungnahme merken wir als spätesten Termin den 07.03.2016 vor.

Mit freundlichen Grüßen,

das Team des KOV Kreditopfervereins

Beilagen:
- Studie „Can banks individually create money out of nothing? – The theories and the empirical evidence“
  URL: http://www.sciencedirect.com/science/article/pii/S1057521914001070
- Studie „A lost century in economics: Three theories of banking and the conclusive evidence“
  URL: http://www.sciencedirect.com/science/article/pii/S1057521915001477
- Artikel „Aufgedeckt: Banken erzeugen mit Krediten Geld aus Luft“
  URL: http://www.geld-magazin.at/flipBooks/gm1602/gm1602.html#12/z

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Can banks individually create money out of nothing? — The theories and the empirical evidence☆

Richard A. Werner

Centre for Banking, Finance and Sustainable Development, University of Southampton, United Kingdom

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ABSTRACT

This paper presents the first empirical evidence in the history of banking on the question of whether banks can create money out of nothing. The banking crisis has revived interest in this issue, but it had remained unsettled. Three hypotheses are recognised in the literature. According to the *financial intermediation theory of banking*, banks are merely intermediaries like other non-bank financial institutions, collecting deposits that are then lent out. According to the *fractional reserve theory of banking*, individual banks are mere financial intermediaries that cannot create money, but collectively they end up creating money through systemic interaction. A third theory maintains that each individual bank has the power to create money 'out of nothing' and does so when it extends credit (the *credit creation theory of banking*). The question which of the theories is correct has far-reaching implications for research and policy. Surprisingly, despite the longstanding controversy, until now no empirical study has tested the theories. This is the contribution of the present paper. An empirical test is conducted, whereby money is borrowed from a cooperating bank, while its internal records are being monitored, to establish whether in the process of making the loan available to the borrower, the bank transfers these funds from other accounts within or outside the bank, or whether they are newly created. This study establishes for the first time empirically that banks individually create money out of nothing. The money supply is created as 'fairy dust' produced by the banks individually, "out of thin air".

> "The choice of a measure of value, of a monetary system, of currency and credit legislation — all are in the hands of society, and natural conditions … are relatively unimportant. Here, then, the decision-makers in society have the opportunity to directly demonstrate and test their economic wisdom — or folly. History shows that the latter has often prevailed."[1]
>
> [Wicksell (1922, p. 3)]

1. Introduction

Since the American and European banking crisis of 2007–8, the role of banks in the economy has increasingly attracted interest within and outside the disciplines of banking, finance and economics. This interest is well justified: Thanks to the crisis, awareness has risen that the most widely used macroeconomic models and finance theories did not provide an adequate description of crucial features of our economies and financial systems, and, most notably, failed to include banks.[2] These bank-less dominant theories are likely to have influenced bank regulators and may thus have contributed to sub-optimal bank regulation: Systemic issues emanating from the banking sector are impossible to detect in economic models that do not include banks, or in finance models that are based on individual, representative financial institutions without embedding these appropriately into macroeconomic models.[3]

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[1] Translated into English by the author. See also Wicksell (1935).

[2] Federal Reserve Vice-Chairman Kohn (2009) bemoaned this issue. Examples of leading macroeconomic and monetary models without any banks include Walsh (2003) and Woodford (2003), but this problem applies to all the conventional macromodels proposed by the major conventional schools of thought, such as the classical, Keynesian, monetarist and neo-classical theories, including real business cycle and DSGE models.

[3] The 'Basel' approach to bank regulation focuses on regulation of capital adequacy. Werner (2010a) has argued that this is based on economic theories that do not feature a special role for banks. For an overview and critique, see Werner (2012).

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1057-5219/

Consequently, many researchers have since been directing their efforts at incorporating banks or banking sectors in economic models.[4] This is a positive development, and the European Conferences on Banking and the Economy (ECOBATE) are contributing to this task, showcased in this second special issue, on ECOBATE 2013, held on 6 March 2013 in Winchester Guildhall and organised by the University of Southampton Centre for Banking, Finance and Sustainable Development. As the work in this area remains highly diverse, this article aims to contribute to a better understanding of crucial features of banks, which would facilitate their suitable incorporation in economic models. Researchers need to know which aspects of bank activity are essential — including important characteristics that may distinguish banks from non-bank financial institutions. In other words, researchers need to know whether banks are unique in crucial aspects, and if so, why.

In this paper the question of their potential ability to create money is examined, which is a candidate for a central distinguishing feature. A review of the literature identifies three different, mutually exclusive views on the matter, each holding sway for about a third of the twentieth century. The present conventional view is that banks are mere financial intermediaries that gather resources and re-allocate them, just like other non-bank financial institutions, and without any special powers. Any differences between banks and non-bank financial institutions are seen as being due to regulation and effectively so minimal that they are immaterial for modelling or for policy-makers. Thus it is thought to be permissible to model the economy without featuring banks directly. This view shall be called the *financial intermediation theory of banking*. It has been the dominant view since about the late 1960s.

Between approximately the 1930s and the late 1960s, the dominant view was that the banking system is 'unique', since banks, unlike other financial intermediaries, can collectively create money, based on the fractional reserve or 'money multiplier' model of banking. Despite their collective power, however, each individual bank is in this view considered to be a mere financial intermediary, gathering deposits and lending these out, without the ability to create money. This view shall be called the *fractional reserve theory of banking*.

There is a third theory about the functioning of the banking sector, with an ascendancy in the first two decades of the 20th century. Unlike the *financial intermediation theory* and in line with the *fractional reserve theory* it maintains that the banking system creates new money. However, it goes further than the latter and differs from it in a number of respects. It argues that each individual bank is not a financial intermediary that passes on deposits, or reserves from the central bank in its lending, but instead creates the entire loan amount out of nothing. This view shall be called the *credit creation theory of banking*.

The three theories are based on a different description of how money and banking work and they differ in their policy implications. Intriguingly, the controversy about which theory is correct has never been settled. As a result, confusion reigns: Today we find central banks – sometimes the very same central bank – supporting different theories; in the case of the Bank of England, central bank staff are on record supporting each one of the three mutually exclusive theories at the same time, as will be seen below.

It matters which of the three theories is right — not only for understanding and modelling the role of banks correctly within the economy, but also for the design of appropriate bank regulation that aims at sustainable economic growth without crises. The modern approach to bank regulation, as implemented at least since Basel I (1988), is predicated on the understanding that the *financial intermediation theory* is correct.[5] Capital adequacy-based bank regulation, even of the counter-cyclical type, is less likely to deliver financial stability, if one of the other two banking hypotheses is correct.[6] The capital-adequacy based approach to bank regulation adopted by the BCBS, as seen in Basel I and II, has so far not been successful in preventing major banking crises. If the *financial intermediation theory* is not an accurate description of reality, it would throw doubt on the suitability of Basel III and similar national approaches to bank regulation, such as in the UK.[7]

It is thus of importance for research and policy to determine which of the three theories is an accurate description of reality. Empirical evidence can be used to test the relative merits of the theories. Surprisingly, no such test has so far been performed. This is the contribution of the present paper.

The remainder of the paper is structured as follows. Section 2 provides an overview of relevant literature, differentiating authors by their adherence to one of the three banking theories. It will be seen that leading economists have gone on the record in support of each one of the theories. In Section 3, I then present an empirical test that is able to settle the question of whether banks are unique and whether they can individually create money 'out of nothing'. It involves the actual processing of a 'live' bank loan, taken out by the researcher from a representative bank that cooperates in the monitoring of its internal records and operations, allowing access to its documentation and accounting systems. The results and some implications are discussed in Section 4.

2. The literature on whether banks can create money

Much has been written on the role of banks in the economy in the past century and beyond. Often authors have not been concerned with the question of whether banks can create money, as they often simply assume their preferred theory to be true, without discussing it directly, let alone in a comparative fashion. This literature review is restricted to authors that have contributed directly and explicitly to the question of whether banks can create credit and money. During time periods when in the authors' countries banks issued promissory notes (bank notes) that circulated as paper money, writers would often, as a matter of course, mention, even if only in passing, that banks create or issue money. In England and Wales, the Bank Charter Act of 1844 forbade banks to "make any engagement for the payment of money payable to bearer on demand." This ended bank note issuance for most banks in England and Wales, leaving the (until 1946 officially privately owned) Bank of England with a monopoly on bank note issuance. Meanwhile, the practice continued in the United States until the 20th century (and was in fact expanded with the similarly timed New York Free Banking Act of 1838), so that US authors would refer to bank note issuance as evidence of the money creation

[4] One older attempt that has stood up to the test of time is Werner (1997).

[5] See, for instance, the first BCBS Working Paper (BCBS, 1999), looking back on the first decade of experience with Basel I for insights into the thinking of the Basel bank regulators. In a section headlined 'Do fixed minimum capital requirements create credit crunches affecting the real economy?', the authors argue: "It would in fact be strange if fixed minimum capital requirements did not bite in some periods, thereby constraining the banks, given that the purpose of bank [capital] requirements is to limit the amount of risk that can be taken relative to capital. However, for this to have an effect on output, it would have to be true that any shortfall in bank lending was not fully made up through lending by other intermediaries or by access to securities markets." This statement presupposes that the *financial intermediation theory* holds. If banks are the creators of the money supply, and in this role unique and different from non-bank financial intermediaries, as the other two hypotheses maintain, then a reduction in bank credit (creation) must have effects that non-bank financial intermediaries cannot compensate for.

[6] See, for instance, Werner (2005, 2010a).

[7] As seen in the work of the Independent Commission on Banking, ICB, 2011, also known as the Vickers Commission. For contributions to the consultation of the ICB, see, for instance, Werner (2010b). The recommendations therein, especially the recommendation to discard the *financial intermediation theory*, were not heeded.

function of banks until much later.[8] For sake of clarity, our main interest in this paper is the question whether banks that *do not issue bank notes* are able to create money and credit out of nothing. As a result, earlier authors, writing mainly about paper money issuance, are only mentioned in passing here, even if it could be said that their arguments might also apply to banks that do not issue bank notes. These include John Law (1705), James Steuart (1767), Adam Smith (1776), Henry Thornton (1802), Thomas Tooke (1838), and Adam Müller (1816), among others, who either directly or indirectly state that banks can individually create credit (in line with the *credit creation theory*).[9]

2.1. The credit creation theory of banking

Influential early writers that argue that non-issuing banks have the power to individually create money and credit out of nothing wrote mainly in English or German, namely Wicksell (1898, 1907), Withers (1909), Schumpeter (1912), Moeller (1925) and Hahn (1920).[10] The review of proponents of the *credit creation theory* must start with Henry Dunning Macleod, of Trinity College, Cambridge, and Barrister at Law at the Inner Temple.[11] Macleod produced an influential opus on banking, entitled *The Theory and Practice of Banking*, in two volumes. It was published in numerous editions well into the 20th century (Macleod, 1855–6; the quotes here are from the 6th edition of 1905). Concerning credit creation by individual banks, Macleod unequivocally argued that individual banks create credit and money out of nothing, whenever they do what is called 'lending':

> "In modern times private bankers discontinued issuing notes, and merely created Credits in their customers' favour to be drawn against by Cheques. These Credits are in banking language termed Deposits. Now many persons seeing a material Bank Note, which is only a Right recorded on paper, are willing to admit that a Bank Note is cash. But, from the want of a little reflection, they feel a difficulty with regard to what they see as Deposits. They admit that a Bank Note is an "Issue", and "Currency," but they fail to see that a Bank Credit is exactly in the same sense equally an "Issue," "Currency," and "Circulation"."
>
> [Macleod (1905, vol. 2, p. 310)]

> "… Sir Robert Peel was quite mistaken in supposing that bankers only make advances out of *bona fide* capital. This is so fully set forth in the chapter on the Theory of Banking, that we need only to remind our readers that all banking advances are made, in the first instance, by **creating credit**" (p. 370, emphasis in original).

In his *Theory of Credit* Macleod (1891) put it this way:

> "A bank is therefore not an office for "borrowing" and "lending" money, but it is a Manufactory of Credit."
>
> [Macleod (1891: II/2, 594)]

According to the *credit creation theory* then, banks create credit in the form of what bankers call 'deposits', and this credit is money. But how much credit can they create? Wicksell (1907) described a credit-based economy in the *Economic Journal*, arguing that

> "The banks in their lending business are not only not limited by their own capital; they are not, at least not immediately, limited by any capital whatever; by concentrating in their hands almost all payments, they themselves create the money required…."
>
> "In a *pure* system of credit, where all payments were made by transference in the bank-books, the banks would be able to grant at any moment any amount of loans at any, however diminutive, rate of interest."[12]
>
> [Wicksell (1907, 214)]

Withers (1909), from 1916 to 1921 the editor of the *Economist*, also saw few restraints on the amount of money banks could create out of nothing:

> "… it is a common popular mistake, when one is told that the banks of the United Kingdom hold over 900 millions of deposits, to open one's eyes in astonishment at the thought of this huge amount of cash that has been saved by the community as a whole, and stored by them in the hands of their bankers, and to regard it as a tremendous evidence of wealth. But this is not quite the true view of the case. Most of the money that is stored by the community in the banks consists of book-keeping credits lent to it by its bankers."
>
> [Withers (1909, pp. 57 ff.)]

> "… The greater part of the banks' deposits is thus seen to consist, not of cash paid in, but of credits borrowed. For every loan makes a deposit …."
>
> [Withers (1909, p. 63)]

> "When notes were the currency of commerce a bank which made an advance or discounted a bill gave its customer its own notes as the proceeds of the operation, and created a liability for itself. Now, a bank makes an advance or discounts a bill, and makes a liability for itself in the corresponding credit in its books."
>
> [Withers (1909, p. 66)]

[8] The practice of issuance of promissory notes by commercial banks has continued for far longer in Scotland and Northern Ireland — namely until today. This did not seem, however, to result in a sizeable literature on bank money creation in the UK throughout the 20th century.

[9] Referring to the issuance of bank notes that circulate as paper money, Smith comments "The banks, when their customers apply to them for money, generally advance it to them in their own promissory notes" (p. 242). … "It is chiefly by discounting bills of exchange, that is, by advancing money upon them before they are due, that the greater part of banks and bankers issue their promissory notes. … The banker, who advances to the merchant whose bill he discounts, not gold and silver, but his own promissory notes, has the advantage of being able to discount to a greater amount by the whole value of his promissory notes, which he finds, by experience, are commonly in circulation. He is thereby enabled to make his clear gain of interest on so much a larger sum" (Smith, 1776, p. 241). "Jeder Provinzialbanquier strebt dahin, sein Privatgeld zum Nationalgelde zu erheben: er strebt nach der größtmöglichen und möglichst allgemeinen Umsetzbarkeit seines Privatgeldes. Es ist in England nicht bloß die Regierung, welche Geld macht, sondern die Bank von England, jede Privatbank, ja jede einzelne Haushaltung (ohne gerade bestimmte Noten auszugeben, aber, in wie fern sie sich an eine bestimmte Bank thätig anschließt) helfen das Geld machen" (Müller, 1816, p. 240). "Sobald die Regierung also die Geldzeichen mechanisch vermehrt, ohne in demselben Maaße jene andern Organe, denen die Vortheile der Geldvermehrung nur indirekt zu gute kommen, zu stärken, ohne um so kräftiger und gerechter das Ganze zu umfassen, so überträgt sie im Grunde nur das Privilegium der Gelderzeugung, das sie im Nahmen des Ganzen ausübt, auf ein einzelnes Organ. … sollte sie [die Regierung] also ihr Privilegium der Gelderzeugung nicht bloß aufheben, sondern das bisher erzeugte Geld zurück nehmen, so gibt sie damit nur dem Privatcredit, das heißt, dem verwöhnten verderbten Privatcredit, oder dem Wucher die förmliche Befugniß in die Hände, die Lücken zu ergänzen, selbst Geldmarken zu machen, und somit seinen verderblichen und vernichtenden Einfluß auf das Ganze nun erst recht zu äußern" (Müller, 1816, p. 305).

[10] There is also another group of writers who to some extent agree with this description, but one way or another downplay its role or importance in practice. In terms of the history of economic thought it can be said that the latter group laid the groundwork and were the founding fathers of the *fractional reserve theory*. To the extent that they recognise the creation of credit by banks out of nothing under certain circumstances one might argue that they could be classified as supporter of either the *credit creation theory* or the *fractional reserve theory*, but to minimise confusion, here the impact their work has had in its common interpretation was chosen, as well as their emphasis on reserves as a key mechanism, so that they were included in the latter theory.

[11] An Inn of Court with the status of a local authority, inside the territory of the City of London Corporation.

[12] This paper was read by Wicksell in London in the Economic Section of the British Association in 1906 and it is recorded in the Economic Journal that Palgrave and Edgeworth commented on it. There is no mentioning of any objections to the claims about the ability of banks to create money out of nothing.

> "… It comes to this that, whenever a bank makes an advance or buys a security, it gives some one the right to draw a cheque upon it, which cheque will be paid in either to it or to some other banks, and so the volume of banking deposits as a whole will be increased and the cash resources of the banks as a whole will be unaltered."
>
> [Withers (1916, p. 45)]

> "When once this fact is recognised, that the banks are still, among other things, manufacturers of currency, just as much as they were in the days when they issued notes, we see how important a function the banks exercise in the economic world, because it is now generally admitted that the volume of currency created has a direct and important effect upon prices. This arises from what is called the "quantity theory" of money …."
>
> [Withers (1916, p. 47)]

> "If, then, the quantity theory is, as I believe, broadly true, we see how great is the responsibility of the bankers as manufacturers of currency, seeing that by their action they affect, not only the convenience of their customers and the profits of their shareholders, but the general level of prices. If banks create currency faster than the rate at which goods are being produced, their action will cause a rise in prices which will have a perhaps disastrous effect …."[13]
>
> [Withers (1916, pp. 54 ff.)]

> "And so it becomes evident, as before stated, that the deposits of the banks which give the commercial community the right to draw cheques are chiefly created by the action of the banks themselves in lending, discounting, and investing" (pp. 71 ff.).

> "… then, it thus appears that credit is the machinery by which a very important part of modern currency is created …" (p. 72).

Withers argues that the sovereign prerogative to manufacture the currency of the nation has effectively been *privatised* and granted to the commercial banks:

> "By this interesting development the manufacture of currency, which for centuries has been in the hands of Government, has now passed, in regard to a very important part of it, into the hands of companies, working for the convenience of their customers and the profits of their shareholders."
>
> [Withers (1916, p. 40)]

While Withers was a financial journalist, his writings had a high circulation and likely contributed to the dissemination of the *credit creation theory* in the form proposed by Macleod (1855–6). This view also caught on in Germany with the publication of Schumpeter's (1912, English 1934) influential book *The Theory of Economic Development*, in which he was unequivocal in his view that each individual bank has the power to create money out of nothing.

> "Something like a certificate of future output or the award of purchasing power on the basis of promises of the entrepreneur actually exists. That is the service that the banker performs for the entrepreneur and to obtain which the entrepreneur approaches the banker. … (The banker) would not be an intermediary, but *manufacturer of credit*, i.e. he would create himself the purchasing power that he lends to the entrepreneur …. One could say, without committing a major sin, that the banker creates money."[14]
>
> [Schumpeter (1912, p. 197, emphasis in original)]

> "[C]redit is essentially the creation of purchasing power for the purpose of transferring it to the entrepreneur, but not simply the transfer of existing purchasing power. … By credit, entrepreneurs are given access to the social stream of goods before they have acquired the normal claim to it. And this function constitutes the keystone of the modern credit structure."
>
> [Schumpeter (1954, p. 107)]

> "The fictitious certification of products, which, as it were, the credit means of payment originally represented, has become truth."[15]
>
> [Schumpeter (1912, p. 223)]

This view was also well represented across the Atlantic, as the writings of Davenport (1913) or Robert H. Howe (1915) indicate. Hawtrey (1919), another leading British economist who like Keynes, had a Treasury background and moved into academia, took a clear stance in favour of the *credit creation theory*:

> "… for the manufacturers and others who have to pay money out, credits are still created by the exchange of obligations, the banker's immediate obligation being given to his customer in exchange for the customer's obligation to repay at a future date. We shall still describe this dual operation as the creation of credit. By its means the banker creates the means of payment out of nothing, whereas when he receives a bag of money from his customer, one means of payment, a bank credit, is merely substituted for another, an equal amount of cash" (p. 20).

Apart from Schumpeter, a number of other German-language authors also argued that banks create money and credit individually through the process of lending.[16] Highly influential in both academic discourse and public debate was Dr. Albert L. Hahn (1920), scion of a Frankfurt banking dynasty (similarly to Thornton who had been a banker) and since 1919 director of the major family-owned Effecten- und Wechsel-Bank, Frankfurt. Like Macleod a trained lawyer, he became an honorary professor at Goethe-University

[13] "Since, then, variations in the quantity of currency have these widespread effects, it is a matter which bankers have to consider seriously, how far it is possible from them to apply some scientific regulation to the volume of currency, and whether it is possible to modify the evils that follow from wide fluctuations in prices by some such regulation" (p. 55). For a more recent application and more precise formulation of this principle, see Werner's Quantity Theory of Credit (Werner, 1992, 1997, 2005, 2012). "… the most important of the modern forms of currency, namely the cheque, is, in effect, manufactured for the use of its customers by banks; and, further, that since the volume of currency has an important effect upon raising prices, the extent to which currency is thus created is a responsibility which has to be seriously considered by those who work the financial machine. This manufacture of currency is worked through the granting of credit, and credit may thus be defined, for the purposes of this inquiry, as the process by which finance makes currency for its customers. As we saw in the last chapter, deposits, which are potential currency as they carry with them the right to draw a cheque, are produced largely through the loans, discounts and investments made by bankers" (p. 63). "The creation of credit is thus seen clearly to result in the manufacture of currency whenever the banks buy bills of exchange … or make an advance …. In either case the banks give somebody the right to draw cheques. … When a bank makes an advance to a stock broker the result is exactly the same …. The same result, in rather a different form, happens when a bank makes investments on its own account. … There has thus been, in each case, an increase in deposits through the operation of the bank in lending, discounting, or investing. If we can imagine all the banks suddenly selling all their investments and bills of exchange and calling in all their advances, the process could only be brought about by the cancelling of deposits, their own and one another's" (p. 72).

[14] "Etwas Ähnliches wie eine Bescheinigung künftiger Produkte oder wie die Verleihung von Zahlkraft an die Versprechungen des Unternehmers gibt es nun wirklich. Das ist der Dienst, den der Bankier dem Unternehmer erweist und um den sich der Unternehmer an den Bankier wendet. … so wäre er nicht Zwischenhändler, sondern *Produzent von Kredit*, d.h. er würde die Kaufkraft, die er dem Unternehmer leiht, selbst schaffen …. Man könnte ohne große Sünde sagen, daß der Bankier Geld schaffe" (S. 197). Translated by author.

[15] "Die fiktive Bescheinigung von Produkten, die die Kreditzahlungsmittel sozusagen ursprünglich darstellten, ist zur Wahrheit geworden" (Schumpeter, 1912, S. 223). Translated by author.

[16] For instance, Moeller (1925) states that "In the modern monetary system the creation of new paper or bank accounting currency ('Buchungsgeld', or 'bank book money') is primarily in the hands of the banks. … For the deposit money the same largely applies as for paper money …" (pp. 177 ff.).

Frankfurt in 1928. Clearly not only aware of the works of Macleod, whom he cites, but also likely aware of actual banking practice from his family business, Hahn argued that banks do indeed 'create money out of nothing':

> "Every credit that is extended in the economy creates a deposit and thus the means to fund it. … The conclusion from the process described can be expressed in reverse by saying … that every deposit that exists somewhere and somehow in the economy has come about by a prior extension of credit."[17]
>
> [Hahn (1920, p. 28)]

> "We thus maintain – contrary to the entire literature on banking and credit – that the primary business of banks is not the liability business, especially the deposit business, but that in general and in each and every case an asset transaction of a bank must have previously taken place, in order to allow the possibility of a liability business and to cause it: The liability business of banks is nothing but a reflex of prior credit extension. The opposite view is based on a kind of optical illusion …."[18]
>
> [Hahn (1920, p. 29)]

Overall, Hahn probably did more than anyone to popularise the *credit creation theory* in Germany, his book becoming a bestseller, and spawning much controversy and new research among economists in Germany. It also greatly heightened awareness among journalists and the general public of the topic in the following decades. The broad impact of his book was likely one of the reasons why this theory remained entrenched in Germany, when it had long been discarded in the UK or the US, namely well into the post-war period. Hahn's book was however not just a popular explanation without academic credibility. Schumpeter cited it positively in the second (German) edition of his *Theory of Economic Development* (Schumpeter, 1926), praising it as a further development in line with, but beyond, his own book. The English translation of Schumpeter's influential book Schumpeter (1912 [1934]) also favourably cites Hahn.

It can be said that support for the *credit creation theory* appears to have been fairly widespread in the late 19th and early 20th century in English and German language academic publications. By 1920, the *credit creation theory* had become so widespread that it was dubbed the 'current view', the 'traditional theory' or the 'time-worn theory of bank credit' by later critics.[19]

The early Keynes seemed to also have been a supporter of this dominant view. In his *Tract on Monetary Reform* (Keynes, 1924), he asserts, apparently without feeling the need to establish this further, that banks create credit and money, at least in aggregate:

> "The internal price level is mainly determined by the amount of credit created by the banks, chiefly the Big Five …" (p. 178).
>
> "The amount of credit, so created, is in its turn roughly measured by the volume of the banks' deposits — since variations in this total must correspond to the variations in the total of their investments, bill-holdings, and advances" (p. 178).

We know from Keynes' contribution to the Macmillan Committee (1931) that Keynes meant with this that each individual bank was able to create credit:

> "It is not unnatural to think of the deposits of a bank as being created by the public through the deposit of cash representing either savings or amounts which are not for the time being required to meet expenditure. But the bulk of the deposits arise out of the action of the banks themselves, for by granting loans, allowing money to be drawn on an overdraft or purchasing securities a bank creates a credit in its books, which is the equivalent of a deposit" (p. 34).

Concerning the banking system as a whole, this bank credit and deposit creation was thought to influence aggregate demand and the formation of prices, as Schumpeter (1912) had argued:

> "The volume of bankers' loans is elastic, and so therefore is the mass of purchasing power …. The banking system thus forms the vital link between the two aspects of the complex structure with which we have to deal. For it relates the problems of the price level with the problems of finance, since the price level is undoubtedly influenced by the mass of purchasing power which the banking system creates and controls, and by the structure of credit which it builds …. Thus, questions relating to the volume of purchasing power and questions relating to the distribution of purchasing power find a common focus in the banking system" (Macmillan Committee, 1931, pp. 12 ff.).
>
> "… if, finally, the banks pursue an easier credit policy and lend more freely to the business community, forces are set in motion increasing profits and wages, and therefore the possibility of additional spending arises" (p. 13).

Concerning the question whether credit demand or credit supply is more important, the report argued that the root cause is the movement of the supply of credit:

> "The expansion or contraction of the amount of credit made available by the banking system in other directions will, through a variety of channels, affect the ease of embarking on new investment propositions. This, in turn, will affect the volume and profitableness of business, and hence react in due course on the amount of accommodation required by industry from the banking system. … Thus what started as an alteration in the *supply* of credit ends up in the guise of an alteration in the *demand* for credit" (p. 99).[20]

While money is thus seen as endogenous to credit, when what is called a 'bank loan' is extended, the Committee argued that bank credit was exogenous as far as loan applicants are concerned:

> "There can be no doubt as to the power of the banking system … to increase or decrease the volume of bank money" (p. 102).
>
> "In normal conditions we see no reason to doubt the capacity of the banking system to influence the volume of active investment by

[17] "Jeder Kredit der gegeben wird, erzeugt seinerseits ein Deposit und damit die Mittel zu seiner Unterbringung. … Die Folgerung aus dem skizzierten Vorgang kann man auch umgekehrt ausrücken, indem man sagt – und dieser Schluß ist ebenso zwingend – , daß jedes irgendwie und irgendwo in der Volkswirtschaft vorhandene Scheck- oder Ueberweisungsguthaben sein Entstehen einer vorausgegangenen Kreditgewährung, einem zuvor eingeräumten Kredit zu verdanken hat" (S. 28). Translated by author.

[18] "Wir behaupten also im Gegensatz zu der gesamten, in dieser Beziehung so gut wie einigen Bank- und Kreditliteratur, daß nicht das Passivgeschäft der Banken, insbesondere das Depositengeschäft das Primäre ist, sondern daß allgemein und in jedem einzelnen Falle ein Aktivgeschäft einer Bank vorangegangen sein muß, um erst das Passivgeschäft einer Bank möglich zu machen und es hervorzurufen: Das Passivgeschäft der Banken ist nichts anderes als ein Reflex vorangegangener Kreditgewährung. Die entgegengesetzte Ansicht beruht auf einer Art optischer Täuschung …" (S. 29). Translated by author.

[19] See, for instance, Phillips (1920, p. 72, p. 119).

[20] This is in line with the credit supply determination view proposed by Werner (1997, 2005) and his Quantity Theory of Credit, as opposed to the endogenous credit supply view of many post-Keynesians.

increasing the volume and reducing the cost of bank credit. … Thus we consider that in any ordinary times the power of the banking system … to increase or diminish the active employment of money in enterprise and investment is indisputable" (p. 102).

The Macmillan Committee also argued that bank credit could be manipulated by the Bank of England, and thus was also considered exogenous in this sense.

The credit creation theory remained influential until the early post-war years. The links of credit creation to macroeconomic and financial variables were later formalised in the Quantity Theory of Credit (Werner, 1992, 1997, 2005, 2012), which argues that credit for (a) productive use in the form of investments for the production of goods and services is sustainable and non-inflationary, as well as less likely to become a non-performing loan, (b) unproductive use in the form of consumption results in consumer price inflation and (c) unproductive use in the form of asset transactions results in asset inflation and, if large enough, banking crises. However, since the 1920s serious doubts had spread about the veracity of the *credit creation theory of banking*. These doubts were initially uttered by economists who in principle supported the theory, but downplayed its significance. It is this group of writers that served as a stepping stone to the formulation of the modern *fractional reserve theory*, which in its most widespread (and later) version however argues that individual banks cannot create credit, but only the banking system in aggregate. It is this theory about banks that we now turn to.

2.2. The fractional reserve theory

An early proponent of the *fractional reserve theory* was Alfred Marshall (1888). He testified to a government committee about the role of banks as follows:

"I should consider what part of its deposits a bank could lend and then I should consider what part of its loans would be redeposited with it and with other banks and, vice versa, what part of the loans made by other banks would be received by it as deposits. Thus I should get a geometrical progression; the effect being that if each bank could lend two thirds of its deposits, the total amount of loaning power got by the banks would amount to three times what it otherwise would be."

[Marshall (1888), as quoted by Yohe (1995, p. 530)]

With this, he contradicted Macleod's arguments. However, Marshall's view was still a minority view at the time. After the end of the First World War, a number of influential economists argued that the 'Old Theory' (Phillips, 1920:72) of bank credit creation by individual banks was mistaken. Their view gradually became more influential. "The theory of deposit expansion reached its zenith with the publication of C.A. Phillips' Bank Credit …" (Goodfriend, 1991, as quoted by Yohe, 1995, p. 532).

Phillips (1920) argued that it was important to distinguish between the theoretical possibility of an individual bank 'manufacturing money' by lending in excess to cash and reserves on the one hand, and, on the other, the banking system as a whole being able to do this. He argued that the 'Old Theory' (the *credit creation theory*) was

"predicated upon the contention that a bank would be able to make loans to the extent of several times the amount of additional cash newly acquired and held *at the time the loans were made*, whereas a representative bank in a system is actually able ordinarily to lend an amount only roughly equal to such cash" (p. 72).[21]

According to Phillips (1920), individual banks cannot create credit or money, but collectively the banking system does so, as a new reserve is "split into small fragments, becomes dispersed among the banks of the system. Through the process of dispersion, it comes to constitute the basis of a manifold loan expansion" (p. 40). Each bank is considered mainly a financial intermediary: "… the banker … handles chiefly the funds of others" (pp. 4–5). Phillips argued that since banks target particular cash to deposit and reserve to deposit ratios (as cited in the money multiplier), which they wish to maintain, each bank effectively works as an intermediary, lending out as much as it is able to gather in new cash. Through the process of dispersion and re-iteration, the financial intermediation function of individual banks, without the power to create credit, adds up to an expansion in the money supply in aggregate.[22]

Crick (1927) shared this conclusion (with some minor caveats). Thus he argued:

"The important point, which is responsible for much of the controversy and most of the misunderstanding, is that while one bank receiving an addition to its cash cannot forthwith undertake a full multiple addition to its own deposits, yet the cumulative effect of the additional cash is to produce a full multiple addition to the deposits of all the banks as a whole" (p. 196).

"Summing up, then, it is clear … that the banks, so long as they maintain steady ratios of cash to deposits, are merely passive agents of the Bank of England policy, as far as the volume of money in the form of credit is concerned. … The banks … have very little scope for policy in the matter of expansion or contraction of deposits, though they have in the matter of disposition of resources between loans, investments and other assets. But this is not to say that the banks cannot and do not effect multiple additions to or subtractions from deposits as a whole on the basis of an expansion of or contraction in bank cash" (p. 201).

The role of banks remained disputed during the 1920s and 1930s, as several writers criticised the *credit creation theory*. Views not only diverged, but were also in a flux, as several experts apparently shifted their position gradually — overall an increasing number moving away from the *credit creation theory* and towards the *fractional reserve theory*.

Sir Josiah C. Stamp, a former director of the Bank of England, summarised the state of debate in his review of an article by Pigou (1927):

"The general public economic mind is in a fair state of muddlement at the present moment on the apparently simple question: "Can the banks create credit, and if so, how, and how much?" and between the teachings of Dr. Leaf and Mr. McKenna, Messrs. Keynes, Hawtrey, Cassel and Cannan and Gregory, people have not yet found their way."

[Stamp (1927, p. 424)]

[21] His analysis was based on the "overlooked … pivotal fact that an addition to the usual volume of a bank's loans tends to result in a *loss of reserve* for that bank only somewhat less on average than the amount of the additional loans. … Manifold loans are not extended by an individual bank on the basis of a given amount of reserve" (Phillips, 1920, p. 73).

[22] It should be noted here that Phillips' (1920) work can be interpreted in a more differentiated manner. For instance, Phillips did also point out that if all banks increased their lending at roughly the same pace, each bank *would*, after all, be able to create credit without losing reserves or cash, on balance (pp. 78 ff.). However, subsequent writers citing Phillips usually do not mention this. While a more detailed discussion of Phillips is, however, beyond the scope of this paper, it is here merely claimed that Phillips' argument was an important stepping stone towards the formulation of the *fractional reserve theory* of banking, which is unequivocal in treating individual banks as mere financial intermediaries without the power to create credit or money individually under any and all circumstances, even though it could possibly be argued that Phillips himself may not have agreed with the latter in all respects.

Contributions to this debate were also made by Dennis Robertson (1926), who was influenced by Keynes.[23] Keynes (1930) explains the role of reserve holdings and the mechanics of determining a bank's behaviour based on its preference to hold cash and reserves, together with the amount of reserves provided by the central bank — the fairly predetermined mechanics postulated by the money multiplier in a fractional reserve model:

> "Thus in countries where the percentage of reserves to deposits is by law or custom somewhat rigid, we are thrown back for the final determination of M, the Volume of Bank-money on the factors which determine the amount of these reserves" (p. 77).

Keynes (1930) also backed a key component of the *fractional reserve theory*, namely that banks gather deposits and place parts of them with the central bank, or, alternatively, may withdraw funds from their reserves at the central bank in order to lend these out to the non-banking sector of the economy:

> "When a bank has a balance at the Bank of England in excess of its usual requirements, it can make an additional loan to the trading and manufacturing world, and this additional loan creates an additional deposit (to the credit of the borrower or to the credit of those to whom he may choose to transfer it) on the other side of the balance sheet of this or some other bank."
>
> [Keynes (1930, vol. 2, p. 218)]

Keynes here argues that new deposits, based on new loans, are dependent upon and connected to banks' reserve balances held at the central bank. This view is sometimes also supported by present-day central bankers, such as in Paul Tucker's or the ECB's proposal to introduce negative interest rates on banks' reserve holdings at the central bank, as an incentive for them to 'move' their money from the central bank and increase lending.[24] Nevertheless, part of Keynes (1930), and much of his most influential work, his *General Theory* (1936), appears more in line with the *financial intermediation theory*, as will be discussed in the following section.

A representative example of the *fractional reserve theory* that at the same time was beginning to point in the direction of the *financial intermediation theory* is the work by Lutz (1939), who published in *Economica*, a forum for some of these debates at the time:

> "The expansion of the economic system leads to an increase in the volume of deposits to a figure far in excess of the amount of the additional cash in use, simply because the same cash is deposited with the banking system over and over again. … The fact that banking statistics show an aggregate of deposits far above the amount of cash in the banking system, is therefore not of itself a sign that the banks must have *created* the whole of the difference. This conclusion is also, of course, somehow implicit in the "multiple expansion" theory of the creation of bank deposits (of the Phillips or Crick variety). That theory explains the creation of deposits by the fact that the same cash (in decreasing amounts) is successively paid into different banks. It does, however, look upon this cash movement rather in the nature of a technical affair between banks … which would disappear if the separate banks were merged into one. In that case the deposits would be regarded as coming into existence by outright creation. In our example we assume throughout only one bank, and still the deposits grow out of the return, again and again, of the same cash *by the public*. … The force which really creates expansion is the trade credit given by producers to one another. … The bank plays the role of a mere intermediary."
>
> … This seems to lead not to a new, but to a very old theory of the function of banks: the function of a mere intermediary … (pp. 166 ff.).

> "The modern idea of banks being able to create deposits seemed to be a startling departure from the view held by most economists in the nineteenth century. If, however, we approach this modern idea along the lines followed above, we find that it resolves itself into much the same elements as those which many of the older writers regarded as the essence of banking operations: the provision of confidence which induces the economic subjects to extend credit to each other by using the bank as an intermediary" (p. 169).

Phillips' influence has indeed been significant. Even in 1995 Goodfriend still argued that

> "… Phillips showed that the summation of the loan- and deposit-creation series across all individual banks yields the multiple expansion formulas for the system as a whole. Phillips' definitive exposition essentially established the theory once and for all in the form found in economics textbooks today."
>
> [as reprinted in Yohe (1995, p. 535)]

Statements like this became the mainstream view in the 1950s and 1960s.[25] The view of the *fractional reserve theory* in time also came to dominate textbook descriptions of the functioning of the monetary and banking system. There is no post-war textbook more representative and influential than that of Samuelson (1948). The original first edition is clear in its description of the *fractional reserve theory*: Under the heading "Can banks really create money?", Samuelson first dismisses "false explanations still in wide circulation" (p. 324):

> "According to these false explanations, the managers of an ordinary bank are able, by some use of their fountain pens, to lend several dollars for each dollar left on deposit with them. No wonder practical bankers see red when such behavior is attributed to them. They only wish they could do so. As every banker well knows, he cannot invest money that he does not have; and any money that he does invest in buying a security or making a loan will soon leave his bank" (p. 324).

Samuelson thus argues that a bank needs to gather the funds first, before it can extend bank loans. This is not consistent with the *credit creation theory*. However, Samuelson argues that, in aggregate, the banking system creates money. He illustrates his argument with the example of a 'small bank' that faces a 20% reserve requirement, and considering the accounts of the bank (B/S). If this bank receives a new cash deposit of $1000, "What can the bank now do?", Samuelson asks (p. 325).

> "Can it expand its loans and investments by $4000 …?"
>
> "The answer is definitely 'no'. Why not? Total assets equal total liabilities. Cash reserves meet the legal requirement of being 20

[23] In the Introduction, Robertson says: "I have had so many discussions with Mr. J. M. Keynes on the subject matter of chapters V and VI, and have rewritten them so drastically at his suggestion, that I think neither of us now knows how much of the ideas therein contained is his, and how much is mine (p. 5)." (As cited in Keynes, 1930.)

[24] On Paul Tucker's proposal, see BBC (2013), and also the critique by Werner (2013a). Negative rates on bank reserves at the central bank were actually imposed by the Swedish central bank in 2009, the Danish central bank in 2012 and for the first time by the Swiss central bank in 1978 on deposits by foreign banks.

[25] Even though a closer reading of Alhadeff (1954) shows that the author agreed that, under certain circumstances, banks can create credit and money: "In certain cases, the proportion between the legal reserve ratio and residual deposits is such that even a single bank can expand its deposits to a somewhat greater amount than its primary deposits. … Again, it might be possible for a very large bank, or a bank in an isolated community with few business connections with outside banks, literally to create money because of flow back deposits. [Footnote: 'Flow-back deposits refer to the circulation of deposits among the depositors of the same bank.'] In either case, this amounts to a partial reduction in the average cost of producing credit (making loans), at least in terms of the raw material costs …" (Alhadeff, 1954, p. 7). Although Alhadeff, if studied closely, could be said to have agreed that an individual bank can create credit out of nothing, he clearly thought this to be a special case without practical relevance, while it is normally only the banking system in aggregate that creates credit.

per cent of total deposits. True enough. But how does the bank pay for the investments or earning assets that it buys? Like everyone else it writes out a check — to the man who sells the bond or signs the promissory note. … The borrower spends the money on labor, on materials, or perhaps on an automobile. The money will very soon, therefore, have to be paid out of the bank. … A bank cannot eat its cake and have it too. Table 4b gives, therefore a completely false picture of what an individual bank can do" (pp. 325 ff.).

Instead, Samuelson explains, since all the money lent out will leave the bank, an individual bank cannot create credit out of nothing:

"As far as this first bank is concerned, we are through. Its legal reserves are just enough to match its deposits. There is nothing more it can do until the public decides to bring in some more money on deposit" (p. 326).

On the other hand, Samuelson emphasises that

"The banking system as a whole can do what each small bank cannot do!" (p. 324),

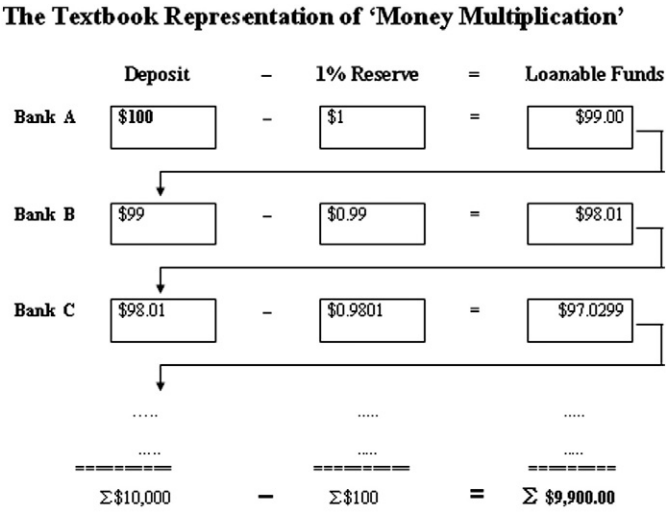
namely create money. This, Samuelson explains via the iterative process of one bank's loans (based on prior deposits) becoming another bank's deposits, and so forth. He shows "this chain of deposit creation" in a table, amounting to total deposits in the banking system of $5000 (out of the $1000), due to the reserve requirement of 20% implying a 'money multiplier' of 5 times (assuming no cash 'leakage').

What Samuelson calls the "multiple deposit expansion" is described in the same way and with remarkable similarity in the fifteenth edition of his book (Samuelson & Nordhaus, 1995) half a century later, only that the reserve requirement cited as example has been lowered to 10%: "All banks can do what one can't do alone" (p. 493). There are subtle though important differences. The overall space devoted to this topic is much smaller in 1995 compared to 1948. The modern textbook says that the central bank-created reserves are used by the banks "as an input" and then "transformed" "into a much larger amount of bank money" (p. 490). There is far less of an attempt to deal with the *credit creation theory*. Instead, each bank is unambiguously represented as a pure financial intermediary, collecting deposits and lending out this money (minus the reserve requirement).[26] The *fractional reserve theory* had become mainstream:

"Each small bank is limited in its ability to expand its loans and investments. It cannot lend or invest more than it has received from depositors" (p. 496).

Meanwhile, bank deposit money is "supplied" by "the financial system" in an abstract process that each individual bank has little control over (p. 494). The unambiguous fractional reserve theory thus appears to have come about in the years after the 1950s. It can be described in Fig. 1.

In this scheme, funds move between the public, the banks and the central bank without any barriers. Each bank is a financial intermediary, but in aggregate, due to fractional reserve banking, money is created (multiplied) in the banking system. Specifically, each bank can only grant a loan if it has previously received new reserves, of which a fraction will always be deposited with the central bank. It will then only be able to lend out as much as these excess reserves, as is made clear in major textbooks. In the words of Stiglitz (1997):



Source: Werner (2005), p. 175.

Fig. 1. The fractional reserve theory as represented in many textbooks.

"It should be clear that when there are many banks, no individual bank can create multiple deposits. Individual banks may not even be aware of the role they play in the process of multiple-deposit creation. All they see is that their deposits have increased and therefore they are able to make more loans" (p. 737).

In another textbook on money and banking:

"In this example, a person went into bank 1 and deposited a $100,000 check drawn on another bank. That $100,000 became part of the reserves of bank 1. Because that deposit immediately created excess reserves, further loans were possible for bank 1. Bank 1 lent the excess reserves to earn interest. A bank will not lend more than its excess reserves because, by law, it must hold a certain amount of required reserves."

[Miller and VanHoose (1993, p. 331)]

The deposit of a cheque from another bank does not however increase the "total amounts of deposits and money":

"Remember, though, that the deposit was a check written on another bank. Therefore, the other bank suffered a decline in its transactions deposits and its reserves. While total assets and liabilities in bank 1 have increased by $100,000, they have decreased in the other bank by $100,000. *Thus the total amount of money and credit in the economy is unaffected by the transfer of funds from one depository institution to another*. Each depository institution can create loans (and deposits) only to the extent that it has excess reserves. The thing to remember is that new reserves are not created when checks written on one bank are deposited in another bank. The Federal Reserve System, however, can create new reserves" (p. 331).

The textbook by Heffernan (1996) says:

"To summarise, all modern banks act as intermediaries between borrowers and lenders, but they may do so in a variety of different ways, from the traditional function of taking deposits and lending a percentage of these deposits, to fee-based financial services" (p. 18).

"For the bank, which pools these surplus funds, there is an opportunity for profit through fractional reserve lending, that is, lending out

[26] Moreover, the original Samuelson (1948: 331) offered an important (even though not prominently displayed) section headed 'Simultaneous expansion or contraction by all banks', which provided the caveat that each individual bank could, after all, create deposits, if only all banks did the same at the same rate (thus outflows being on balance cancelled by inflows, as Alhadeff, 1954, also mentioned). There is no such reference in the modern, 'up-to-date' textbook.

money at an interest rate which is higher than what the bank pays on the deposit, after allowing for the riskiness of the loan and the cost of intermediation" (p. 20).

While the *fractional reserve theory* succeeded in attracting many followers, rendering it an important and influential theory until this day, it is not famous for its clarity:

> "The problem of the manner in which the banking system increases the total volume of the circulating medium, while at the same time the lending power of the individual banks is severely limited, has proved to be one of the most baffling for writers on banking theory."
> [Mints (1945, p. 39)]

Several attempts were made to resolve this within the *fractional reserve theory* of banking, such as that by Saving (1977), who rendered the supply of bank deposits a function of the behaviour of the savers — arguing that the money supply is endogenous. This effectively pushed out the intermediary function from the individual bank level to the economy level, and helped ushering in the formulation of the *financial intermediation theory* to which we now turn.

2.3. The financial intermediation theory

While the *fractional reserve theory* of banking was influential from the 1930s to the 1960s, Keynes may have sown important seeds of doubt. Already in his 'Treatise', Keynes (1930) makes use of inverted commas in order to refer, suggestively, to 'The "Creation" of Bank-Money' (a section title). This rhetorical device, employed by the expert already hailed as the leading economist in the world, implied disapproval, as well as mockery of the concept that banks could create money out of nothing. The device was copied by many other writers after Keynes who also emphasised the role of banks as 'financial intermediaries'. In Keynes' words:

> "A banker is in possession of resources which he can lend or invest equal to a large proportion (nearly 90%) of the deposits standing to the credit of his depositors. In so far as his deposits are Savings-deposits, he is acting merely as an intermediary for the transfer of loan-capital. In so far as they are Cash-deposits, he is acting both as a provider of money for his depositors, and also as a provider of resources for his borrowing-customers. Thus the modern banker performs two distinct sets of services. He supplies a substitute for State Money by acting as a clearing-house and transferring current payments backwards and forwards between his different customers by means of book-entries on the credit and debit sides. But he is also acting as a middleman in respect of a particular type of lending, receiving deposits from the public which he employs in purchasing securities, or in making loans to industry and trade mainly to meet demands for working capital. This duality of function is the clue to many difficulties in the modern Theory of Money and Credit and the source of some serious confusions of thought."
> [Keynes (1930, vol. 2, p. 213)]

The Keynes of the *Treatise* seems to say that the two functions of banks are to either act as financial intermediary fulfilling the utility banking function of settling trades, or to act as financial intermediary gathering deposits and lending the majority of these out. There seems no money creation at all involved, certainly not on the individual bank level. Keynes' most influential opus, *General Theory* (Keynes, 1936) quickly eclipsed his earlier *Treatise on Money* in terms of its influence on public debate. In the *General Theory*, Keynes did not place any emphasis on banks, which he now argued were financial intermediaries that needed to acquire deposits before they could lend:

> "The notion that the creation of credit by the banking system allows investment to take place to which 'no genuine saving' corresponds can only be the result of isolating one of the consequences of the increased bank-credit to the exclusion of the others. … It is impossible that the intention of the entrepreneur who has borrowed in order to increase investment can become effective (except in substitution for investment by other entrepreneurs which would have occurred otherwise) at a faster rate than the public decide to increase their savings. … No one can be compelled to own the additional money corresponding to the new bank-credit, unless he deliberately prefers to hold more money rather than some other form of wealth. … Thus the old-fashioned view that saving always involves investment, though incomplete and misleading, is formally sounder than the newfangled view that there can be saving without investment or investment without 'genuine' saving."
> [Keynes (1936, pp. 82 ff.)]

Schumpeter (1954) commented on this shift in Keynes' view:

> The "deposit-creating bank loan and its role in the financing of investment *without any previous saving up of the sums thus lent* have practically disappeared in the analytic schema of the General Theory, where it is again the saving public that holds the scene. Orthodox Keynesianism has in fact reverted to the old view …. Whether this spells progress or retrogression, every economist must decide for himself" (p. 1115, italics in original).

The early post-war period saw unprecedented influence of Keynes' General Theory, and a Keynesian school of thought that managed to ignore Keynes' earlier writings on bank credit creation, became dominant in academia. Given that a former major proponent of both the *credit creation* and the *fractional reserve theories* of banking had shifted his stance to the new *financial intermediation theory*, it is not surprising that others would follow.

A highly influential challenge to the *fractional reserve theory* of banking was staged by Gurley and Shaw (1955, 1960). They rejected the view that "banks stand apart in their ability to create loanable funds out of hand while other intermediaries in contrast are busy with the modest brokerage function of transmitting loanable funds that are somehow generated elsewhere" (1955, p. 521). Beyond the usual rhetorical devices to denigrate the alternative theories, Gurley and Shaw's actual argument was that banks should not be singled out as being 'special', since the banks' financial intermediation function is identical to that of other financial intermediaries:

> "There are many similarities between the monetary system and non-monetary intermediaries, and the similarities are more important than the differences. Both types of financial institutions create financial claims; and both may engage in multiple creation of their particular liabilities in relation to any one class of asset that they hold."
> [Gurley and Shaw (1960, p. 202)]

Banks and the banking system, we are told, like other financial intermediaries, need to first gather deposits, and then are able to lend these out. In this view, any remaining special role of banks is due to outmoded regulations, which treat banks differently. Therefore, they argue, the Federal Reserve should extend its banking supervision to the growing set of non-bank financial intermediaries, thus treating them equally to banks.

Initial challenges by proponents of the *fractional reserve theory* of banking (see Guttentag & Lindsay, 1968) were swept away during the 1960s, when James Tobin, a new rising star in economics, took a clear stand to proclaim another 'new view' of banking, formulating the modern version of the *financial intermediation theory* of banking.

> "Tobin (1963), standing atop the wreckage in 1963 to set forth the 'new view' of commercial banking, stands squarely with Gurley and Shaw against the traditional view."
> [Guttentag and Lindsay (1968, p. 993)]

Like Keynes, Alhadreff and others before him, Tobin only referred to bank credit creation in inverted commas, and used rhetorical devices to ridicule the idea that banks, individually or collectively, could create money and credit. Tobin (1963) argued:

> "Neither individually nor collectively do commercial banks possess a widow's cruse" (p. 412).

> "The distinction between commercial banks and other financial intermediaries has been too sharply drawn. The differences are of degree, not of kind …. In particular, the differences which do exist have little intrinsically to do with the monetary nature of bank liabilities … The differences are more importantly related to the special reserve requirements and interest rate ceilings to which banks are subject. Any other financial industry subject to the same kind of regulations would behave in much the same way" (p. 418).

Banks only seem to be different from others, because regulators erroneously chose to single them out for special regulation. In Tobin's view, "commercial banks are different, because they are controlled, and not the other way around" (Guttentag & Lindsay, 1968, p. 993). Tobin and Brainard's (1963) portfolio model made no distinction between banks and non-bank financial intermediaries, indeed, ignored the role of banks altogether and contributed much towards the modern mainstream view of economics models without banks. Branson (1968) further developed Tobin's new approach, which was popular in the leading journals.

Guttentag and Lindsay (1968) wrote in the *Journal of Political Economy* that despite the challenge by Gurley and Shaw (1955) "The uniqueness issue, on the other hand, remains unsettled" (p. 992). Banks, they argued, are different in their role and impact from non-bank financial intermediaries, since "commercial banks have a greater capacity for varying the aggregate volume of credit than other financial intermediaries" (p. 991). "These points provide a rationale for special controls on commercial banks that goes beyond the need to prevent financial panic. It is the rationale that has been sought by defenders of the traditional view that commercial banks are 'unique' ever since the Gurley–Shaw challenge to this view" (p. 991).

Undaunted, Tobin (1969) re-states his view in an article establishing his portfolio balance approach to financial markets, which argues that financial markets are complex webs of assets and prices, leaving banks as one of many types of intermediaries, without any special role.[27] This was the first article in the first edition of a new journal, the *Journal of Money, Credit and Banking*. While its name may suggest openness towards the various theories of banking, in practice it has only published articles that did not support the *credit creation theory* and were mainly in line with the *financial intermediation theory*. This is also true for most other journals classified as 'leading journals' in economics (for instance, using the 4-rated journals from the UK Association of Business Schools list in economics). Henceforth, the portfolio balance approach, which treated all financial institutions as mere portfolio managers, was to hold sway. It helped the *financial intermediation theory* become the dominant creed among economists world-wide.

Modern proponents of the ubiquitous *financial intermediation theory* include, among others, Klein (1971), Monti (1972), Sealey and Lindley (1977), Diamond and Dybvig (1983), Diamond (1984, 1991, 2007), Eatwell, Milgate, and Newman (1989), Gorton and Pennacchi (1990), Bencivenga and Smith (1991), Bernanke and Gertler (1995), Rajan (1998), Myers and Rajan (1998), Allen and Gale (2000, 2004a,b), Allen and Santomero (2001), Diamond and Rajan (2001), Kashyap, Rajan, and Stein (2002), Hoshi and Kashyap (2004), Matthews and Thompson (2005), Casu and Girardone (2006), Dewatripont, Rochet and Tirole (2010), Gertler and Kiyotaki (2011) and Stein (2014). There are many more: It is impossible to draw up a conclusive list, since the vast majority of articles published in leading economics and finance journals in the last thirty to forty years is based on the *financial intermediation theory* as premise.[28]

Quoting only a few examples, Klein (1971), Monti (1972) (later to become EU commissioner and prime minister of Italy), and others model banks as financial intermediaries, gathering deposits and lending these funds out:

> "The bank has two primary sources of funds; the equity originally invested in the firm … and borrowed funds secured through the issuance of various types of deposits …."
>
> [Klein (1971, p. 208)]

> "… It will be shown how the bank determines the prices it will pay for various types of deposits and how these prices, in conjunction with the deposit supply functions the bank confronts, determine the scale and composition of the bank's deposit liabilities the bank will assume."
>
> [Klein (1971, p. 210)]

Diamond and Dybvig (1983) are cited as the seminal work on banking, and they argue that "Illiquidity of assets provides the rationale both for the existence of banks and for their vulnerability to runs" (p. 403). But in actual fact their theory makes no distinction between banks and non-banks. They therefore are unable to explain why we have heard of bank runs, but not of 'insurance runs' or 'finance company runs', although the latter also hold illiquid assets and give out loans. Diamond and Dybvig fail to identify what could render banks special since they assume that they are not.

Other theories of banks as financial intermediaries are presented by Mayer (1988) and Hellwig (1977, 1991, 2000), who also believe that banks are merely financial intermediaries:

> "The analysis uses the original model of Diamond (1984) of financial contracting with *intermediation as delegated monitoring*. … Monitoring is assumed to be too expensive to be used by the many households required to finance a firm or an intermediary. However direct finance of firms based on nonpecuniary penalties may be dominated by intermediated finance with monitoring of firms by an intermediary who in turn obtains funds from households through contracts involving nonpecuniary penalties."
>
> [Hellwig (2000, pp. 721 ff.)]

Banking expert Heffernan (1996) states:

> "The existence of the "traditional" bank, which intermediates between borrower and lender, and which offers a payments service to its customers, fits in well with the Coase theory" (p. 21).

[27] The conclusion of Tobin's paper: "According to this approach, the principal way in which financial policies and events affect aggregate demand is by changing the valuations of physical assets relative to their replacement costs. Monetary policies can accomplish such changes, but other exogenous events can too. In addition to the exogenous variables explicitly listed in the illustrative models, changes can occur, and undoubtedly do, in the portfolio preferences – asset demand functions – of the public, the banks, and other sectors. These preferences are based on expectations, estimates of risk, attitudes towards risk, and a host of other factors. In this complex situation, it is not to be expected that the essential impact of monetary policies and other financial events will be easy to measure in the absence of direct observation of the relevant variables (q in the models). There is no reason to think that the impact will be captured in any single exogenous or intermediate variable, whether it is a monetary stock or a market interest rate" (Tobin, 1969, p. 29).

[28] This also means that the innumerable PhD theses and Masters dissertations produced in this area in the last thirty years or so are mainly based on the *financial intermediation theory*. For instance, Wolfe (1997) states: "Banks possess the power of intermediation, which is the ability to transform deposits into loans. Deposits with one set of characteristics are transformed into assets with other or different characteristics" (p. 12).

… or a leading textbook on international economics and finance, by Krugman and Obstfeld (2000):

> "Banks use depositors' funds to make loans and to purchase other assets …" (p. 659).

A widely used reference work on banking and money – the New Palgrave *Money* (Eatwell et al., 1989) – contains a number of contributions by leading monetary economists and banking experts. In it, Baltensperger (1989) clearly supports the *financial intermediation theory*:

> "The role of credit as such must be clearly separated from the economic role of credit institutions, such as banks, playing the role of specialised intermediaries in the credit market by buying and simultaneously selling credit instruments (of a different type and quality). Since the ultimate borrowers and lenders can, in principle, do business with each other directly, without the help of such an intermediary, the function of these middlemen must be viewed as separate from that of credit as such. Two main functions of institutions of this kind can be distinguished. The first is the function of risk consolidation and transformation. … The second major function of these institutions is that of a broker in the credit markets. As such, they specialise in producing intertemporal exchange transactions and owe their existence to their ability to bring together creditors and debtors at lower costs than the latter can achieve in direct transactions themselves" (pp. 100 ff.).

Indeed, almost all authors in this reference book refer to banks as mere financial intermediaries, even Goodhart (1989):

> "'Intermediation' generally refers to the interposition of a financial institution in the process of transferring funds between ultimate savers and ultimate borrowers. … Disintermediation is then said to occur when some intervention, usually by government agencies for the purpose of controlling, or regulating, the growth of financial intermediaries, lessens their advantages in the provision of financial services, and drives financial transfers and business into other channels. … An example of this is to be found when onerous reserve requirements on banks lead them to raise the margin (the spread) between deposit and lending rates, in order to maintain their profitability, so much that the more credit-worthy borrowers are induced to raise short-term funds directly from savers, for example, in the commercial paper market" (p. 144).

Myers and Rajan (1998) state:

> "We model the intermediary as a bank that borrows from a number of individual investors for its own core business and to lend on to a project. … Even though the bank can extract more from the ultimate borrower, the bank has to finance these loans by borrowing from individual investors" (p. 755).

Allen and Santomero (2001), in their paper entitled 'What do financial intermediaries do?' state:

> "In this paper we use these observations as a starting point for considering what it is that financial intermediaries do. At center, of course, financial systems perform the function of reallocating the resources of economic units with surplus funds (savers) to economic units with funding needs (borrowers)" (p. 272).

Kashyap (2002) also believes that banks are pure financial intermediaries, not materially distinguishable from other non-bank financial institutions.[29]

Stein (2014) states, albeit with some hesitation:

> "… at least in some cases, it seems that a bank's size is determined by its deposit franchise, and that, taking these deposits as given, its problem then becomes one of how best to invest them" (p. 5).

> "Overall, our synthesis of these stylised facts is that banks are in the business of taking deposits and investing these deposits in fixed-income assets that have certain well-defined risk and liquidity attributes but which can be either loans or securities" (p. 7).

The *financial intermediation theory* includes the 'credit view' in macroeconomics, proposing a 'bank lending channel' of monetary transmission (Bernanke & Blinder, 1989; Bernanke & Gertler, 1995), as well as the neo-classical and new classical macroeconomic models (if they consider banks at all). To these and most contemporary authors in economics and finance, banks are financial intermediaries like other firms in the financial sector, which focus on the 'transformation' of liabilities with particular features into assets with other features (e.g. with respect to maturity, liquidity and quantity/size), or which focus on 'monitoring' others (Sheard, 1989, another adherent of the *financial intermediation theory of banking*), but do not create credit individually or collectively. This is true for many 'Post-Keynesians' who argue that the money supply is determined by the demand for money. It is also true for popular descriptions, such as that by Koo and Fujita (1997) who argue that banks are merely financial intermediaries:

> "But those financial institutions that are counterparties of the Bank of Japan obtain their funding primarily from the money that depositors have deposited with them. This money they cannot pass on for consumption and capital investment, because they have to lend it at interest to earn money. In other words, for this money to support the economy, these financial institutions must lend it to firms and individuals. Those borrowers must then use it to buy assets such as machinery or housing or services" (p. 31).

A recent paper by Allen, Carletti, and Gale (2014) introduces money — albeit only cash created by the central bank, while banks are mere financial intermediaries that cannot create money or credit.

As a result, the leading forecasting models used by policy makers also do not include banks (Bank of England, 2014a). Even the original meaning of credit creation seems forgotten by the modern literature: Bernanke (1993) uses the expression 'credit creation' much in his article, but explains that this concept is defined as "the process by which saving is channeled to alternative uses", i.e. financial intermediation of savers' deposits into loans:

> "This fortuitous conjunction of events and ideas has contributed to an enhanced appreciation of the role of credit in the macroeconomy by most economists and policymakers. The purpose of this paper is to review and interpret some recent developments in our understanding of the macroeconomic role of credit or, more accurately, of the credit creation process. By *credit creation process* I mean the process by which, in exchange for paper claims, the savings of specific individuals or firms are made available for the use of other individuals or firms (for example to make capital investments or simply to consume). Note that I am drawing a strong distinction between credit creation, which is the process by which saving is channeled to alternative uses, and the act of saving itself …. In my broad conception of the credit creation process I include most of the value-added of the financial industry, including the information-gathering, screening, and monitoring activities required to make sound loans or investments, as well as much of the risk-sharing, maturity transformation, and liquidity provision services that attract savers and thus support the basic lending and investment functions. I also want to include in my definition of the credit creation process activities undertaken by potential borrowers to transmit information about themselves to lenders: for example, for firms, these activities include provision of data to the

[29] See Werner (2003b) for a detailed critique of Kashyap (2002).

public, internal or external auditing, capital structure decisions, and some aspects of corporate governance. The *efficiency* of the credit creation process is reflected both in its ability to minimise the direct costs of extending credit (for example, the aggregate wage bill of the financial industry) and in the degree to which it is able to channel an economy's savings into the most productive potential uses. The presumption of traditional macroeconomic analysis is that this credit creation process, through which funds are transferred from ultimate savers to borrowers, works reasonably smoothly and therefore can usually be ignored."

[Bernanke (1993, pp. 50 ff.)]

As Bernanke points out, those works that assume such a financial intermediation role for banks will therefore often ignore banks entirely: they cannot be particularly important or relevant in the economy. Many went as far as to leave out any kind of money (there are no monetary aggregates in Kiyotaki & Moore, 1997; Woodford, 2003). The most widely used textbook in advanced Master-level economics at leading British universities in 2010 was Romer (2006). On page 3, Romer tells us:

"Incorporating money in models of [economic] growth would only obscure the analysis" (p. 3).

2.4. Conclusion of the literature review

Since the 1960s it has become the conventional view not to consider banks as unique and able to create money, but instead as mere financial intermediaries like other financial firms, in line with the *financial intermediation theory of banking*. Banks have thus been dropped from economics models, and finance models have not suggested that bank action has significant macroeconomic effects. The questions of where money comes from and how the money supply is created and allocated have remained unaddressed.

The literature review has identified a gradual progression of views from the *credit creation theory* to the *fractional reserve theory* to the present-day ubiquitous *financial intermediation theory*. The development has not been entirely smooth; several influential writers have either changed their views (on occasion several times) or have shifted between the theories. Keynes, as an influential economist, did little to enhance clarity in this debate, as it is possible to cite him in support of each of the three hypotheses, through which he seems to have moved sequentially.[30] Some institutions, such as the Bank of England, manage to issue statements in support of all three theories.

We conclude from the literature survey that all three theories of banking have been well represented in the course of the 20th century, by leading figures of the day. However, the conclusion by Sir Josiah Stamp (1927), a director at the Bank of England, still seems to hold today, namely that there is "a fair state of muddlement … on the apparently simple question: 'Can the banks create credit, and if so, how, and how much?'" Despite a century or so of theorising on the matter, there has been little progress in establishing facts unambiguously. Thus today the conclusion of 1968 applies, namely that the issue cannot be considered as 'settled'. It is possible that the pendulum is about to swing away from the *financial intermediation theory* to one of the other two. But how can we avoid that history will merely repeat itself and the profession will spend another century locked into a debate without firm conclusion?

How can the issue be settled and the 'muddlement' cleared up? One reason for this "state of muddlement" is likely to be the methodology dominant in 20th century economics, namely the hypothetico-deductive method. Unproven 'axioms' are 'posed' and unrealistic assumptions added, to build a theoretical model. This can be done for all three theories, and we would be none the wiser about which of them actually applied. How can the issue be settled? The only way the facts can be established is to leave the world of deductive theoretical models and consider empirical reality as the arbiter of truth, in line with the inductive methodology. In other words, it is to empirical evidence we must turn to settle the issue.

3. The empirical test

The simplest possible test design is to examine a bank's internal accounting during the process of granting a bank loan. When all the necessary bank credit procedures have been undertaken (starting from 'know-your-customer' and anti-money laundering regulations to credit analysis, risk rating to the negotiation of the details of the loan contract) and signatures are exchanged on the bank loan, the borrower's current account will be credited with the amount of the loan. The key question is whether as a prerequisite of this accounting operation of booking the borrower's loan principal into their bank account the bank actually withdraws this amount from another account, resulting in a reduction of equal value in the balance of another entity — either drawing down reserves (as the *fractional reserve theory* maintains) or other funds (as the *financial intermediation theory* maintains). Should it be found that the bank is able to credit the borrower's account with the loan principal without having withdrawn money from any other internal or external account, or without transferring the money from any other source internally or externally, this would constitute prima facie evidence that the bank was able to create the loan principal out of nothing. In that case, the credit creation theory would be supported and the theory that the individual bank acts as an intermediary that needs to obtain savings or funds first, before being able to extend credit (whether in conformity with the *fractional reserve theory* or the *financial intermediation theory*), would be rejected.

3.1. Expected results

With a bank loan of €200,000, drawn by the researcher from a bank, the following changes in the lending bank's accounting entries are expected a priori according to each theory:

(a) Bank credit accounting according to the *credit creation theory*. According to this theory, banks behave very differently from financial intermediaries, such as stock brokers, since they do not separate customer funds from own funds. Money 'deposited' with a bank becomes the legal property of the bank and the 'depositor' is actually a lender to the bank, ranking among the general creditors. When extending bank credit, banks create an imaginary deposit, by recording the loan amount in the borrower's account, although no new deposit has taken place (credit creation out of nothing). The balance sheet lengthens. Cash, central bank reserves or balances with other banks are not immediately needed, as reserve and capital requirements only need to be met at particular measurement intervals. The account changes are shown in Table 1.

(b) Bank credit accounting according to the *fractional reserve theory*. The distinguishing feature of this theory is that each individual bank cannot create credit out of nothing. The bank is a financial intermediary indistinguishable from other financial intermediaries, such as stock brokers and securities firms. However, banks are said to be different in one respect, namely the regulatory treatment: regulators have placed onerous rules concerning reserves that have to be held with the central bank only on banks, not other financial intermediaries. A bank can only lend money,

Table 1
Account changes due to bank loan (*credit creation theory*).

Assets		Liabilities	
Loans and investments	+E 200	Deposits (borrower's A/C)	+E 200
Total	+E 200	Total	+E 200

[30] Though with the caveat that several of his statements, made at the same time, seem to support different theories of banking.

when it has previously received the same amount in excess reserves from another bank, whose own reserve balances will have declined, or from the central bank (Table 2).

Table 2
Account changes due to bank loan (*fractional reserve theory*).

Step 1. Precondition for the bank loan			
Assets		Liabilities	
Excess Reserves	+E 200	Deposits	+E 200
Total	+E 200	Total	+E 200
Step 2. The bank loan			
Assets		Liabilities	
Excess Reserves	– E 200		
Loans and investments	+E 200		
Total	0	Total	0

> "A bank will not lend more than its excess reserves because, by law, it must hold a certain amount of required reserves. … Each depository institution can create loans (and deposits) only to the extent that it has excess reserves."
>
> [Miller and VanHoose (1993, p. 331)]

Following the exposition in Miller and VanHoose (1993, pp. 330–331), the balance sheet evolution in case of a €200,000 loan is as shown in Table 2.

In other words, for the bank to be able to make a loan, it first has to check its excess reserves, as this is, according to this theory, a strictly binding requirement and limitation, as well as its distinguishing feature. The bank cannot at any moment lend more money than its excess reserves, and it will have to draw down the reserve balance to lend. (Thus, as noted, another distinguishing feature is that the balance sheet expansion is driven by the prior increase in a deposit that boosted excess reserves, *not* by the granting of a loan).

It needs to be verified when the empirical test of bank lending is implemented, whether the bank first confirmed the precise amount of its available excess reserves before entering into the loan contract or paying out the loan funds to the customer, so as not to exceed that figure. If the bank is found not to have checked or not to have drawn down its reserve balances then this constitutes a rejection of the *fractional reserve theory*.

(c) Bank credit accounting according to the *financial intermediation theory*.

According to this theory, banks are, as far as payments and accounts are concerned, not different from non-bank financial institutions. The reserve requirement is not an issue — a claim supported by the empirical observation that reserve requirements have been abolished in a number of major economies, such as the UK and Sweden many years ago. However, UK financial intermediaries are required by FSA/FCA-administered Client Money rules to hold deposits in custody for customers (a form of warehousing, the deposits legally being bailments). Client funds of financial intermediaries, such as securities firms, stock brokers and the like are therefore still owned by the depositors and thus kept separately from the financial institutions' own funds, so that customer deposits are not shown on the balance sheet as liabilities. If banks are merely financial intermediaries, indistinguishable from other intermediaries, then all bank funds are central bank money that can be held in reserve at the central bank or deposited with other banks. The balance sheet implications are shown below in Table 3.

According to this theory, the bank balance sheet does not lengthen as a result of the bank loan: the funds for the loan are drawn from the bank's reserve account at the central bank.

Table 3
Account changes due to bank loan (*fin. intermediation theory*).

Assets		Liabilities	
Excess Reserves	– E 200		
Loans and investments	+ E 200		
Total	0	Total	0

3.2. A live empirical test

The design of the empirical test takes the form of a researcher entering into a live loan contract with the bank, and the bank extending a loan, while its relevant internal accounting is disclosed. Several banks in the UK and Germany were approached and asked to cooperate in an academic study of bank loan operations.

The large banks declined to cooperate. The reason given was usually twofold: the required disclosure of internal accounting data and procedures would breach their confidentiality or IT security rules; secondly, the transactions volumes of the banks were so large that the planned test would be very difficult to conduct when borrowing sensibly sized amounts of money that would not clash with the banks' internal risk management rules. In that case, any single transaction would not be easy to isolate within the bank's IT systems. Despite various discussions with a number of banks, in the end the banks declined on the basis of the above reasons and additionally that the costs of operating their systems and controlling for any potential other transactions would be prohibitive.

It was therefore decided to approach smaller banks, of which there are many in Germany (there are approximately 1700 local, mostly small banks in Germany). Each owns a full banking license and engages in universal banking, offering all major banking services, including stock trading and currencies, to the general public. A local bank with a balance sheet of approximately €3 billion was approached, as well as a bank with a balance sheet of about €700 million. Both declined on the same grounds as the larger banks, but one suggested that a much smaller bank might be able to oblige, pointing out the advantage that there would be fewer transactions booked during the day, allowing a clearer identification of the empirical test transaction. At the same time the empirical information value would not diminish with bank size, since all banks in the EU conform to identical European bank regulations.

Thus an introduction to Raiffeisenbank Wildenberg e.G., located in a small town in the district of Lower Bavaria was made. The bank is a cooperative bank within the Raiffeisen and cooperative banking association of banks, with eight full-time staff. The two joint directors, Mr. Michael Betzenbichler and Mr. Marco Rebl both agreed to the empirical examination and also to share all available internal accounting records and documentation on their procedures. A written agreement was signed that confirmed that the planned transactions would be part of a scientific empirical test, and the researcher would not abscond with the funds when they would be transferred to his personal account, and undertakes to immediately repay the loan upon completion of the test (Supplementary material 1 in online Appendix 3). One limitation on the accounting records which is common to most banks is that they are outsourcing the IT to a specialised bank IT company, which maintains its own rules concerning data protection and confidentiality.

The IT firm serves the majority of the 1,100 cooperative banks in Germany, using the same software and internal systems and accounting rules, ensuring that the test is representative of more than 15% of bank deposits in Germany.

It was agreed that the researcher would personally borrow €200,000 from the bank. The transaction was undertaken on 7 August 2013 in the offices of the bank in Wildenberg in Bavaria. Apart from the two (sole) directors, also the head (and sole staff) of the credit department, Mr. Ludwig Keil was present. The directors were bystanders not engaging in any action. Mr. Keil was the only bank representative involved in processing the loan from the start of the customer documentation, to

the signing of the loan contract and finally paying out the loan into the borrower's account. The entire transaction, including the manual entries made by Mr. Keil, was filmed. The screens of the bank's internal IT terminal were also photographed. Moreover, a team from the BBC was present and filmed the central part of the empirical bank credit experiment (Reporter Alistair Fee and a cameraman).

The bank disclosed their standard internal credit procedure. The sequence of the key steps is shown in Appendix 1. As can be seen, the last two steps are the signing of the 'credit documents' by the borrower (the researcher) and, finally, the payment of the loan at the value date.[31]

The loan conditions were agreed: the researcher would borrow EUR 200,000 from the bank at the prime rate (the interest rate for the best customer). In the event the bank waived the actual interest proceeds, in support of the scientific research project.

When the bank loan contract was signed by both the bank and the borrower on 7 August 2013, the loan amount was immediately credited to the borrower's account with the bank, as agreed in the loan contract. Supplementary material 2 in online Appendix 2 shows the original borrower's accounts and balances with Raiffeisenbank Wildenberg. The key information from the account summary table is repeated here, in English, in Table 4.

The bank also issued the following accounts overview, which is a standard T-account of the transaction from the borrower's perspective (Table 5).

The borrower confirmed that his new current account with the bank now showed a balance of EUR 200,000 that was available for spending (An extension of the experiment, to be reported on separately, used the balance the following day for a particular transaction outside the banking institution, transferring the funds to another account of the researcher, held with another bank; this transfer was duly completed, demonstrating that the funds could be used for actual transactions).

We are now moving to the empirical test of the three banking theories. The critical question is: where did Raiffeisenbank Wildenberg e.G. obtain the funds from that the borrower (researcher) was credited with (and duly used and transferred out of the bank the following day)? When the researcher inquired about the bank's reserve holdings, in line with the *fractional reserve theory of banking*, director Marco Rebl explained that the bank maintained its reserves with the central organisation of cooperative banks, which in turn maintained an account with the central bank. These reserves amounted to a fixed amount of €350,000 that did not change during the observation period. Concerning the bank credit procedure, the researcher attempted to verify the source of the funds that were about to be lent.

Firstly, the researcher confirmed that the only three bank officers involved in this test and bank transaction were present throughout, whereby two (the directors) only watched and neither accessed any computer terminal nor transmitted any instructions whatsoever. The accounts manager (head of the credit department, Mr. Keil) was the only operator involved in implementing, booking and paying out the loan. His actions were filmed. It was noted and confirmed that none of the bank staff present engaged in any additional activity, such as ascertaining the available deposits or funds within the bank, or giving instructions to transfer funds from various sources to the borrower's account (for instance by contacting the bank internal treasury desk and contacting bank external interbank funding sources). Neither were instructions given to increase, draw down or borrow reserves from the central bank, the central cooperative bank or indeed any other bank or entity. In other words, it was apparent that upon the signing of the loan contract by both parties, the funds were credited to the borrower's account immediately, without any other activity of checking or giving instructions to transfer funds. There were no delays or deliberations or other bookings. The moment the loan was implemented, the borrower saw his current account balance increase by the loan amount. The overall credit transaction, from start to finish, until funds were available in the borrower's account, took about 35 min (and was clearly slowed down by the filming and frequent questions by the researcher).

Secondly, the researcher asked the three bank staff present whether they had, either before or after signing the loan contract and before crediting the borrower's account with the full loan amount inquired of any other parties internally or externally, checked the bank's available deposit balances, or made any bookings or transfers of any kind, in connection to this loan contract. They all confirmed that they did not engage in any such activity. They confirmed that upon signing the loan contract the borrower's account was credited immediately, without any such steps.

Thirdly, the researcher obtained the internal daily account statements from the bank. These are produced only once a day, after close of business. Since the bank is small, it was hoped that it would be possible to identify the impact of the €200,000 loan transaction, and distinguish the accounting pattern corresponding to one of the three banking hypotheses.

Table 4
The empirical researcher's new bank account.
Bank: Raiffeisenbank Wildenberg e.G.
Customer: Richard Werner.
Date: 7 August 2013.

Account no.	Type of product	Currency	A/C balance
Current account			
44636	Current account w/o fees	EUR	200,000.00
Total in EUR:			200,000.00
Loan			
20044636	Other private financing	EUR	−200,000.00
Total in EUR:			−200,000.00

4. Results

Supplementary material 3 in online Appendix 3 shows the scan of the bank's balance sheet at the end of 6 August 2013, the day before the transaction of the empirical test was undertaken. Supplementary material 4 in online Appendix 3 shows the daily balance of the following day. In Table 6 the key asset positions are summarised and account names translated, for the end of the day prior to the loan experiment, and for the end of the day on which the researcher had borrowed the money. Table 7 shows the key liability positions for the same periods:

Starting by analysing the liability side information (Table 7), we find that customer deposits are considered part of the financial institution's balance sheet. This contradicts the *financial intermediation theory*, which assumes that banks are not special and are virtually indistinguishable from non-bank financial institutions that have to keep customer deposits off balance sheet. In actual fact, a bank considers a customers' deposits starkly differently from non-bank financial institutions, who record customer deposits off their balance sheet. Instead we find that the bank treats customer deposits as a loan to the bank, recorded under rubric 'claims by customers', who in turn receive as record of their loans to the bank (called 'deposits') what is known as their

Table 5
The empirical researcher's new bank account balances.

Accounts' overview				
EUR	Credit	Liabilities	Balance	No. contracts
Current account	200,000.00		200,000.00	1
Loan		200,000.00	−200,000.00	1
Bank sum total	200,000.00	200,000.00	0.00	2

[31] It is of interest that the last step expressly requires the bank staff implementing this credit procedure to only pay out the loan for the agreed purpose, as evidence for which a receipt for any purchases undertaken with the loan funds are demanded by the bank. This demonstrates that the implementation of policies of credit guidance by purpose of the loan is practically possible, since such data is available and the use of the loan is monitored and enforced by each bank.

Table 6
Raiffeisenbank Wildenberg e.G.: daily accounts' assets.
6 August 2013, 22.46 h. vs. 7 August 2013, 22.56 h.
EUR.

Assets	Balance 6 Aug. 2013	Balance 7 Aug. 2013	Difference
1. Cash	181,703.03	340,032.89	158,329.86
2. Bills of exchange			
3. Claims on financial. inst.	5,298,713.76	5,079,709.21	−219,004.55
4. Claims on customers	23,712,558.13	23,947,729.92	235,171.79
–Maturing daily	*932,695.44*	*967,767.32*	*35,071.88*
–Maturity under 4 years	*1,689,619.97*	*1,889,619.97*	*200,000.00*
–Maturity 4 years or longer	*21,090,242.72*	*21,090,342.72*	*100.00*
5. Bonds, bills, debt instr.	19,178,065.00	19,178,065.00	
6. Stocks and shares			
7. Stake holdings	397,768.68	397,768.68	
8. Stakes in related firms			
9. Trust assets	5262.69	5262.69	
10. Compensation claims on the public sector			
11. Immaterial assets	102.00	102.00	
12. Fixed assets	221,549.46	221,549.46	
13. Called but not deployed capital			
14. Other assets	707,569.26	711,288.64	3719.38
15. Balancing item	2844.32	2844.32	
16. Sum of assets	49,706,136.33	49,884,352.81	178,216.48

'account statement'. This can only be reconciled with the *credit creation* or *fractional reserve theories* of banking.

We observe that an amount not far below the loan balance (about €190,000) has been deposited with the bank. This is itself not far from the increase in total liabilities (and assets). Since the *fractional reserve hypothesis* requires such an increase in deposits as a precondition for being able to grant the bank loan, i.e. it must precede the bank loan, it is difficult to reconcile this observation with the *fractional reserve theory*. Moreover, the researcher confirmed that in his own bank account the loan balance of €200,000 was shown on the same day. This means that the increase in liabilities was driven by the increase by €200,000 in daily liabilities (item 2B BA in Table 7). Thus the total increase in liabilities could not have been due to a coincidental increase in customer deposits on the day of the loan. The liability side account information seems only fully in line with the *credit creation theory*.

Turning to an analysis of the asset side, we note that the category where we find our loan is item 4, claims on customers — fortunately the only one that day with a maturity below 4 years and hence clearly identifiable on the bank balance sheet. Apparently, customers also took out short-term loans (most likely overdrafts) amounting to €35,071.88, producing a total new loan balance of €235,071.88. In order to keep the analysis as simple as possible, let us proceed from here assuming that our test loan amounted to this total loan figure (€235,071.88). So the balance sheet item of interest on the asset side is ΔA4, the increase in loans (claims on customers) amounting to €235,071.88.

We now would like to analyse the balance sheet in order to see whether this new loan of €235,071.88 was withdrawn from other accounts at the bank, or how else it was funded. We first proceed with considering activity on the asset side. Denoting balances in thousands below, we can summarise the balance sheet changes during the observation period, within the balance sheet constraints as follows:

$$\begin{aligned}\Delta\text{Assets} = {} & \Delta A1(\text{cash}) + \Delta A3(\text{claims on other FI}) \\ & + \Delta A4(\text{claims on customers}) + \Delta A14(\text{other assets}).\end{aligned} \tag{1}$$

Numerically, these are, rounded in thousand euro:

$$178 = 158 - 219 + 235 + 4. \tag{2}$$

The *fractional reserve theory* says that the loan balance must be paid from reserves. These can be either cash balances or reserves with other banks (including the central bank). The deposits (claims) with other financial institutions (which effectively includes the bank's central bank reserve balances) declined significantly, by €219,000. At the same time cash reserves increased significantly. What may have happened is that the bank withdrew legal tender from its account with the cooperative central bank, explaining both the rise in cash and decline in balances with other financial institutions. Since the theories do not distinguish between these categories, we can aggregate A1 and A3, the cash balances and reserves. Also, to simplify, we aggregate A14 (other assets) with A4 (claims on customers), to obtain:

$$\underset{(\Delta\text{Assets})}{178} \quad \underset{(\Delta\text{reserves})}{=-61} \quad \underset{(\Delta\text{claims on customers, others})}{+239}. \tag{3}$$

We observe that reserves fell, while claims on customers rose significantly. Moreover, total assets also rose, by an amount not dissimilar to our loan balance. Can this information be reconciled with the three theories of banking?

Considering the *financial intermediation hypothesis*, we would expect a decline in reserves (accounts with other financial institutions and cash) of the same amount as customer loans increased. Reserves however declined by far less. At the same time, the balance sheet expanded, driven by a significant increase in claims on customers. If the bank borrowed money from other banks in order to fund the loan (thus reducing its balance of net claims on other banks), in line with the *financial intermediation* theory of banking, vault cash should not increase and neither should the balance sheet. We observe both a significant rise in cash holdings and an expansion in the total balance sheet (total assets and total liabilities), which rose by €178,000. This cannot be reconciled with the *financial intermediation theory*, which we therefore must consider as rejected.

Considering the *fractional reserve theory*, we confirmed by asking the credit department's Mr. Keil, as well as the directors, that none of them checked their reserve balance or balance of deposits with other banks before signing the loan contract and making the funds available to the borrower (see the translated letter in Appendix 2, and the original letter in the online Appendix 3. Furthermore, there seems no evidence that reserves (cash and claims on other financial institutions) declined in an amount commensurate with the loan taken out. Finally, the observed increase in the balance sheet can also not be reconciled with the standard description of the *fractional reserve theory*. We must therefore consider it as rejected, too.

This leaves us with the *credit creation theory*. Can we reconcile the observed accounting asset side information with it? And what do we learn from the liability side information?

The transactions are linked to each other via the accounting identities of the balance sheet (Eqs. (1), (2) and (3)). We can therefore ask the question what would have happened to total assets, if we assumed for the

Table 7
Raiffeisenbank Wildenberg e.G.: daily accounts' liabilities.
6 August 2013, 22.46 h. vs. 7 August 2013, 22.56 h.
EUR.

Liabilities	Balance 6 Aug. 2013	Balance 7 Aug. 2013	Difference
1. Claims by financial inst.	5,621,456.60	5,621,879.66	423.06
2. Claims by customers	39,589,177.09	39,759,156.42	169,979.33
2A. Savings accounts	*10,234,806.01*	*10,237,118.24*	*2312.23*
2B. Other liabilities	*29,354,371.08*	*29,522,038.18*	*167,667.10*
–BA daily	*13,773,925.93*	*13,963,899.89*	*189,973.96*
–BB maturity less 4 years	*13,296,042.92*	*13,273,736.06*	*−22,306.86*
–BC maturity 4 years or longer	*2,284,402.23*	*2,284,402.23*	
4. Trust liabilities	5262.70	5262.70	
5. Other liabilities	12,378.81	12,599.44	220.63
6. Balancing item	16,996.04	16,996.04	
7. Reserves	1,138,497.64	1,138,497.64	
11. Fund for bank risk	250,000.00	250,000.00	
12. Own capital	3,057,248.57	3,057,248.57	
13. Sum liabilities	49,706,136.33	49,884,352.81	178,216.48

moment that no other transaction had taken place, apart from the loan (235). We can set the change in each asset item (except for ΔA4, our loan) to zero, if we subtract the same amount from the change in total assets. The new total asset balance in this hypothetical scenario would be:

$$178-158+219-4=235 \tag{4}$$

or, in general,

$$\Delta A4(\text{claims on customers}) = \Delta\text{Assets}-\Delta A1(\text{cash})-\Delta A3(\text{claims on other FI}) -\Delta A14(\text{other assets}). \tag{5}$$

In other words, if the other transactions had not happened, the bank's balance sheet would have expanded by the same amount as the loans taken out. This finding is consistent only with the *credit creation theory* of bank lending.

The evidence is not as easily interpreted as may have been desired, since in practice it is not possible to stop all other bank transactions that may be initiated by bank customers (who are nowadays able to implement transactions via internet banking even on holidays). But the available accounting data cannot be reconciled with the *fractional reserve* and the *financial intermediation* hypotheses of banking.

5. Conclusion

This paper was intended to serve two functions. First, the history of economic thought was examined concerning the question of how banks function. It was found that a long-standing controversy exists that has not been settled empirically. Secondly, empirical tests were conducted to settle the existing and continuing controversies and find out which of the three theories of banking is consistent with the empirical observations.

5.1. Three theories but no empirical test

Concerning the first issue, in this paper we identified three distinct hypotheses concerning the role of banks, namely the *credit creation theory*, the *fractional reserve theory* and the *financial intermediation theory*. It was found that the first theory was dominant until about the mid- to late 1920s, featuring leading proponents such as Macleod and Schumpeter. Then the second theory became dominant, under the influence of such economists as Keynes, Crick, Phillips and Samuelson, until about the early 1960s. From the early 1960s, first under the influence of Keynes and Tobin and the *Journal of Money, Credit and Banking*, the *financial intermediation theory* became dominant.

Yet, despite these identifiable eras of predominance, doubts have remained concerning each theory. Most recently, the *credit creation theory* has experienced a revival, having been championed again in the aftermath of the Japanese banking crisis in the early 1990s (Werner, 1992, 1997) and in the run-up to and aftermath of the European and US financial crises since 2007 (see Bank of England, 2014b; Benes & Kumhof, 2012; Ryan-Collins, Greenham, Werner, & Jackson, 2011, 2012; Werner, 2003a, 2005, 2012). However, such works have not yet become influential in the majority of models and theories of the macro-economy or banking. Thus it had to be concluded that the controversy continues, without any scientific attempt having been made at settling it through empirical evidence.

5.2. The empirical evidence: credit creation theory supported

The second contribution of this paper has been to report on the first empirical study testing the three main hypotheses. They have been successfully tested in a real world setting of borrowing from a bank and examining the actual internal bank accounting in an uncontrolled real world environment.

It was examined whether in the process of making money available to the borrower the bank transfers these funds from other accounts (within or outside the bank). In the process of making loaned money available in the borrower's bank account, it was found that the bank did not transfer the money away from other internal or external accounts, resulting in a rejection of both the *fractional reserve theory* and the *financial intermediation theory*. Instead, it was found that the bank newly 'invented' the funds by crediting the borrower's account with a deposit, although no such deposit had taken place. This is in line with the claims of the *credit creation theory*.

Thus it can now be said with confidence for the first time – possibly in the 5000 years' history of banking - that it has been empirically demonstrated that each individual bank creates credit and money out of nothing, when it extends what is called a 'bank loan'. The bank does not loan any existing money, but instead creates new money. The money supply is created as 'fairy dust' produced by the banks out of thin air.[32] The implications are far-reaching.

5.3. What is special about banks

Henceforth, economists need not rely on assertions concerning banks. We now know, based on empirical evidence, why banks are different, indeed unique — solving the longstanding puzzle posed by Fama (1985) and others — and different from both non-bank financial institutions and corporations: it is because they can individually create money out of nothing.

5.4. Implications

5.4.1. Implications for economic theory

The empirical evidence shows that of the three theories of banking, it is the one that today has the least influence and that is being belittled in the literature that is supported by the empirical evidence. Furthermore, it is the theory which was widely held at the end of the 19th century and in the first three decades of the twentieth. It is sobering to realise that since the 1930s, economists have moved further and further away from the truth, instead of coming closer to it. This happened first via the half-truth of the *fractional reserve theory* and then reached the completely false and misleading *financial intermediation theory* that today is so dominant. Thus this paper has found evidence that there has been no progress in scientific knowledge in economics, finance and banking in the 20th century concerning one of the most important and fundamental facts for these disciplines. Instead, there has been a regressive development. The known facts were unlearned and have become unknown. This phenomenon deserves further research. For now it can be mentioned that this process of unlearning the facts of banking could not possibly have taken place without the leading economists of the day having played a significant role in it. The most influential and famous of all 20th century economists, as we saw, was a sequential adherent of all three theories, which is a surprising phenomenon. Moreover, Keynes used his considerable clout to slow scientific analysis of the question whether banks could create money, as he instead engaged in ad hominem attacks on followers of the *credit creation theory*. Despite his enthusiastic early support for the *credit creation theory* (Keynes, 1924), only six years later he was condescending, if not dismissive, of this theory, referring to credit creation only in inverted commas. He was perhaps even more dismissive of supporters of the *credit creation theory*, who he referred to as being part of the "Army of Heretics and Cranks, whose numbers and enthusiasm are extraordinary", and who

[32] Thanks to Charlie Haswell for the 'fairy dust' allegory.

seem to believe in "magic" and some kind of "Utopia" (Keynes, 1930, vol. 2, p. 215).[33]

Needless to mention, such rhetoric is not conducive to scientific argument. But this technique was followed by other economists engaged in advancing the *fractional reserve* and later *financial intermediation* theories. US Federal Reserve staffer Alhadeff (1954) argued similarly during the era when economists worked on getting the fractional reserve theory established:

> "One complication worth discussing concerns the alleged "creation" of money by bankers. It used to be claimed that bankers could create money by the simple device of opening deposit accounts for their business borrowers. It has since been amply demonstrated that under a fractional reserve system, only the totality of banks can expand deposits to the full reciprocal of the reserve ratio. [Original footnote: 'Chester A. Phillips, *Bank Credit* (New York: Macmillan, 1921), chapter 3, for the classical refutation of this claim.'] The individual bank can normally expand to an amount about equal to its primary deposits" (p. 7).

The creation of credit by banks had become, in the style of Keynes (1930), an "alleged 'creation'", whereby rhetorically it was suggested that such thinking was simplistic and hence could not possibly be true. Tobin used the rhetorical device of abductio ad absurdum to denigrate the *credit creation theory* by incorrectly suggesting it postulated a 'widow's cruse', a miraculous vessel producing unlimited amounts of valuable physical goods, and thus its followers were believers in miracles or utopias.

This same type of rhetorical denigration of and disengagement with the *credit creation theory* is also visible in the most recent era. For instance, the New Palgrave *Money* (Eatwell et al., 1989), is an influential 340-page reference work that claims to present a 'balanced perspective on each topic' (Eatwell et al., 1989, p. viii). Yet the *financial intermediation theory* is dominant, with a minor representation of the *fractional reserve theory*. The *credit creation theory* is not presented at all, even as a possibility. But the book does include a chapter entitled "Monetary cranks". In this brief chapter, Keynes' (1930) derogatory treatment of supporters of the *credit creation theory* is updated for use in the 1990s, with sharpened claws: Ridicule and insult is heaped on several fateful authors that have produced thoughtful analyses of the economy, the monetary system and the role of banks, such as Nobel laureate Sir Frederick Soddy (1934) and C.H. Douglas (1924). Even the seminal and influential work by Georg Friedrich Knapp (1905), still favourably cited by Keynes (1936), is identified as being created by a 'crank'. What these apparently wretched authors have in common, and what seems to be their main fault, punishable by being listed in this inauspicious chapter, is that they are adherents of the *credit creation theory*. But, revealingly, their contributions are belittled without it anywhere being stated what their key tenets are and that their analyses centre on the *credit creation theory*, which itself remains unnamed and is never spelled out. This is not a small feat, and leaves one pondering the possibility that the Eatwell et al. (1989) tome was purposely designed to ignore and distract from the rich literature supporting the *credit creation theory*. Nothing lost, according to the authors, who applaud the development that due to

> "the increased emphasis given to monetary theory by academic economists in recent decades, the monetary cranks have largely disappeared from public debate …" (p. 214).

And so has the *credit creation theory*. Since the tenets of this theory are never stated in Eatwell et al. (1989), the chapter on 'Cranks' ends up being a litany of ad hominem denigration, defamation and character assassination, liberally distributing labels such as 'cranks', 'phrase-mongers', 'agitators', 'populists', and even 'conspiracy theorists' that believe in 'miracles' and engage in wishful thinking, ultimately deceiving their readers by trying to "impress their peers with their apparent understanding of economics, even though they had no formal training in the discipline" (p. 214). All that we learn about their actual theories is that, somehow, these ill-fated authors are "opposed to private banks and the 'Money Power' without their opposition leading to more sophisticated political analysis" (p. 215). Any reading of the highly sophisticated Soddy (1934) quickly reveals such labels as unfounded defamation.

To the contrary, the empirical evidence presented in this paper has revealed that the many supporters of the *financial intermediation theory* and also the adherents of the *fractional reserve theory* are flat-earthers that believe in what is empirically proven to be wrong and which should have been recognisable as being impossible upon deeper consideration of the accounting requirements. Whether the authors in Eatwell et al. (1989) did in fact know better is an open question that deserves attention in future research. Certainly the unscientific treatment of the *credit creation theory* and its supporters by such authors as Keynes, who strongly endorsed the theory only a few years before authoring tirades against its supporters, or by the authors in Eatwell et al. (1989), raises this possibility.

5.4.2. Implications for government policy

There are other, far-reaching ramifications of the finding that banks individually create credit and money when they do what is called 'lending money'. It is readily seen that this fact is important not only for monetary policy, but also for fiscal policy, and needs to be reflected in economic theories. Policies concerning the avoidance of banking crises, or dealing with the aftermath of crises require a different shape once the reality of the *credit creation theory* is recognised. They call for a whole new paradigm in monetary economics, macroeconomics, finance and banking (for details, see for instance Werner, 1997, 2005, 2012, 2013a,b) that is based on the reality of banks as creators of the money supply. It has potentially important implications for other disciplines, such as accounting, economic and business history, economic geography, politics, sociology and law.

5.4.3. Implications for bank regulation

The implications are far-reaching for bank regulation and the design of official policies. As mentioned in the Introduction, modern national and international banking regulation is predicated on the assumption that the *financial intermediation theory* is correct. Since in fact banks are able to create money out of nothing, imposing higher capital requirements on banks will not necessarily enable the prevention of boom–bust cycles and banking crises, since even with higher capital requirements, banks could still continue to expand the money supply, thereby fuelling asset prices, whereby some of this newly created money can be used to increase bank capital. Based on the recognition of this, some economists have argued for more direct intervention by

[33] "There is a common element in the theories of nearly all monetary heretics. Their theories of Money and Credit are alike in supposing that in some way the banks can furnish all the real resources which manufacture and trade can reasonably require without real cost to anyone …. For they argue thus. Money (meaning loans) is the life-blood of industry. If money (in this sense) is available in sufficient quantity and on easy terms, we shall have no difficulty in employing to the full the entire available supply of the factors of production. For the individual trader or manufacturer "bank credit" means "working capital"; a loan from his bank furnishes him with the means to pay wages, to buy materials and to carry stocks. If, therefore, sufficient bank credit was freely available, there need never be unemployment. Why then, he asks, if the banks can create credit, should they refuse any reasonable request for it? And why should they charge a fee for what costs them little or nothing? … There can only be one answer: the bankers, having a monopoly of magic, exercise their powers sparingly in order to raise the price. … Where magic is at work, the public do not get the full benefit unless it is nationalised. Our heretic admits, indeed, that we must take care to avoid "inflation"; but that only occurs when credit is created which does not correspond to any productive process. To create credit to meet a genuine demand for working capital can never be inflationary; for such a credit is "self-liquidating" and is automatically paid off when the process of production is finished. … If the creation of credit is strictly confined within these limits, there can never be inflation. Further, there is no reason for making any charge for such credit beyond what is required to meet bad debts and the expense of administration. Not a week, perhaps not a day or an hour, goes by in which some well-wisher of mankind does not suddenly see the light — that here is the key to Utopia" (vol. 2, pp. 217 ff.).

the central bank in the credit market, for instance via quantitative credit guidance (Werner, 2002, 2003a, 2005).

5.4.4. Monetary reform

The Bank of England's (2014b) recent intervention has triggered a public debate about whether the privilege of banks to create money should in fact be revoked (Wolf, 2014). The reality of banks as creators of the money supply does raise the question of the ideal type of monetary system. Much research is needed on this account. Among the many different monetary system designs tried over the past 5000 years, very few have met the requirement for a fair, effective, accountable, stable, sustainable and democratic creation and allocation of money. The view of the author, based on more than twenty-three years of research on this topic, is that it is the safest bet to ensure that the awesome power to create money is returned directly to those to whom it belongs: ordinary people, not technocrats. This can be ensured by the introduction of a network of small, not-for-profit local banks across the nation. Most countries do not currently possess such a system. However, it is at the heart of the successful German economic performance in the past 200 years. It is the very Raiffeisen, Volksbank or Sparkasse banks – the smaller the better – that were helpful in the implementation of this empirical study that should serve as the role model for future policies concerning our monetary system. In addition, one can complement such local public bank money with money issued by local authorities that is accepted to pay local taxes, namely a local public money that has not come about by creating debt, but that is created for services rendered to local authorities or the community. Both forms of local money creation together would create a decentralised and more accountable monetary system that should perform better (based on the empirical evidence from Germany) than the unholy alliance of central banks and big banks, which have done much to create unsustainable asset bubbles and banking crises (Werner, 2013a,b).

Appendix 1. Sequence of steps for the extension of a loan Raiffeisenbank Wildenberg e.G.

1. Negotiations concerning the details of the loan.
2. Receipt of KYC information and opening of a new customer file (new customer).
3. Opening of a current account (new customer).
4. Calculation of the loan and repayment schedule, model calculation, European required customer notification information, record of customer advisory.
5. Entry of loan application into the bank IT system.
6. Check of ability to service and repay the loan/conducting liquidity calculation in loan application.
7. Credit rating of customer, entry into customer file.
8. Search of customer data on central bank data base for singular economic dependencies and entry of results into bank IT.
9. Bank board recommendation on loan application with justification (2 directors).
10. Print out of loan contract, general loan conditions, with handover receipted by customer.
11. Print out of the protocol of the loan process.
12. Approval of credit by bank directors by signing the protocol and the loan contract.
13. Creation of loan account in the IT system.
14. Establishment of credit limit and availability of credit.
15. Appointment with customer.
16. Customer signs credit documents.
17. Payment of loan at the value date, in exchange for evidence of use of the loan in line with the declared use in the loan application.

Appendix 2. Letter of confirmation of facts by Raiffeisenbank Wildenberg e.G. (Translation; original in online Appendix 3).

10 June 2014

Dear Prof. Dr. Werner,

Confirmation of Facts

In connection with the extension of credit to you in August 2014 I am pleased to confirm that neither I as director of Raiffeisenbank Wildenberg eG, nor our staff checked either before or during the granting of the loan to you, whether we keep sufficient funds with our central bank, DZ Bank AG, or the Bundesbank. We also did not engage in any such related transaction, nor did we undertake any transfers or account bookings in order to finance the credit balance in your account. Therefore we did not engage in any checks or transactions in order to provide liquidity.

Yours sincerely,

M. Rebl,
Director, Raiffeisenbank Wildenberg e.G.

Appendix 3. Supplementary data

Supplementary data to this article can be found online at http://dx.doi.org/10.1016/j.irfa.2014.07.015.

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A lost century in economics: Three theories of banking and the conclusive evidence☆

Richard A. Werner

Centre for Banking, Finance and Sustainable Development, Southampton Business School, University of Southampton, United Kingdom

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ABSTRACT

How do banks operate and where does the money supply come from? The financial crisis has heightened awareness that these questions have been unduly neglected by many researchers. During the past century, three different theories of banking were dominant at different times: (1) The currently prevalent *financial intermediation theory of banking* says that banks collect deposits and then lend these out, just like other non-bank financial intermediaries. (2) The older *fractional reserve theory of banking* says that each individual bank is a financial intermediary without the power to create money, but the banking system collectively is able to create money through the process of 'multiple deposit expansion' (the 'money multiplier'). (3) The *credit creation theory of banking*, predominant a century ago, does not consider banks as financial intermediaries that gather deposits to lend out, but instead argues that each individual bank creates credit and money newly when granting a bank loan. The theories differ in their accounting treatment of bank lending as well as in their policy implications. Since according to the dominant *financial intermediation theory* banks are virtually identical with other non-bank financial intermediaries, they are not usually included in the economic models used in economics or by central bankers. Moreover, the theory of banks as intermediaries provides the rationale for capital adequacy-based bank regulation. Should this theory not be correct, currently prevailing economics modelling and policy-making would be without empirical foundation. Despite the importance of this question, so far only one empirical test of the three theories has been reported in learned journals. This paper presents a second empirical test, using an alternative methodology, which allows control for all other factors. The financial intermediation and the fractional reserve theories of banking are rejected by the evidence. This finding throws doubt on the rationale for regulating bank capital adequacy to avoid banking crises, as the case study of Credit Suisse during the crisis illustrates. The finding indicates that advice to encourage developing countries to borrow from abroad is misguided. The question is considered why the economics profession has failed over most of the past century to make any progress concerning knowledge of the monetary system, and why it instead moved ever further away from the truth as already recognised by the credit creation theory well over a century ago. The role of conflicts of interest and interested parties in shaping the current bank-free academic consensus is discussed. A number of avenues for needed further research are indicated.

1. Introduction

The failure by leading economists to incorporate banking in their economic theories has been identified as a significant and costly weakness (Werner, 1997, 2005; Kohn, 2009). Likewise, it has been pointed out that the macro-economic feedback of banking activity had been neglected in finance research (Werner, 2012). Recognition of these shortcomings has led to the emergence of 'macro finance' as a new discipline, nested within the finance research agenda. The present paper contributes to this growing literature by addressing a long-standing central dispute about the role and function of banks, which has major implications for monetary and macroeconomics, finance and banking, as well as government policy: it is the question whether a bank lends existing money or newly creates the money it lends.

As Werner (2014b) showed, during different time periods of the 20th century, one of three distinct and mutually exclusive theories of banking has been dominant: The oldest, the *credit creation theory of banking*, maintains that each bank can individually create money 'out of nothing' through accounting operations, and does so when extending a loan. The *fractional reserve theory* states that only the banking system as a whole can collectively create money, while each individual bank is a

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E-mail address: werner@soton.ac.uk.

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mere financial intermediary, gathering deposits and lending these out. The *financial intermediation theory* considers banks as financial intermediaries both individually and collectively, rendering them indistinguishable from other non-bank financial institutions in their behaviour, especially concerning the deposit and lending businesses, being unable to create money individually or collectively.

Although various economists support each of the three theories, and despite the pivotal significance for research and policy, the question which of the three theories is accurate has until recently not been empirically examined. The first empirical test published in a learned journal on this issue was Werner (2014b), in which the author obtained the cooperation of a bank to examine the actual operations and accounting entries taking place when a 'live' bank loan is granted and paid out. It was found that only the credit creation theory was consistent with the observed empirical evidence. However, as a 'live' empirical test of a bank in operation, the test design did not allow a fully controlled environment: Advances in IT and service offerings mean that bank operations take place continuously, even 'after hours' and during holidays (thanks to online banking and round-the-clock banking IT systems). As a result, during the observation interval of one day, other transactions took place in addition to the test transaction. While the final results of the test were unambiguous, a number of aggregated uncontrolled factors had to be jointly evaluated. Therefore as a robustness check it would be desirable to test the three theories of banking using a different methodology, in a fully controlled environment, without the potential interference from other transactions.

The main contribution of the present paper is to provide such an alternative empirical test, allowing complete control of all other factors. For this purpose, use is made of the fact that modern banking and its constituent accounting operations take place entirely within the IT systems of banks. In this paper a controlled test design is proposed that uses the relevant banking software to simulate a bank loan transaction and booking it as if it was a real transaction. While humans may change their behaviour in such simulation situations when they become aware of the nature of the test, such potential bias does not apply to software code. The test of booking a bank loan in banking software yields the finding that the credit creation theory of banking alone conforms to the empirical facts, providing a separate and different corroboration of the findings in Werner (2014b).

The results from the test on bank lending are used to throw new light on capital adequacy-based bank regulation (such as the Basel III/CRR approach) and its alleged ability to prevent banking crises, illustrated through the case of the capital raising by Swiss bank Credit Suisse in 2008. It is found that capital adequacy-based bank regulation cannot prevent banking crises. Instead, it is noted that central bank guidance of bank credit and banking systems dominated by small banks have a superior track record in generating stable growth without crises.

Furthermore, the question is asked why the economics profession has singularly failed over most of the past century to make any progress in terms of knowledge of the monetary system, and instead moved ever further away from the truth as already recognised by the credit creation theory well over a century ago. The role of conflicts of interest is discussed and a number of avenues for needed further research are indicated.

The paper is structured as follows: The second section will briefly survey the literature on the three theories of banking and their differing accounting implications. Section 3 presents the new empirical test. Section 4 analyses and interprets the results. Section 5 applies the insights to examining capital adequacy-based bank regulation, considering the case of Credit Suisse. Section 6 discusses the implications for development policies, and specifically, the advice for developing countries to borrow from abroad in order to stimulate economic growth. Section 7 considers the failure by academic and central bank economists to make progress for a century concerning the role of banks. Closing words are recorded in Section 8.

2. A brief overview of the three main theories of banking and their accounting

Like Werner (2014b), this brief literature review is confined to works by authors who are concerned with banks that cannot issue bank notes. With a few exceptions, the citations differ from those in Werner (2014b) and are meant to complement them. Several authors of the 'Austrian' and 'post-Keynesian' schools of thought are included, which had not been cited by Werner (2014b).

2.1. The financial intermediation theory of banking

The presently dominant *financial intermediation theory* holds that banks are merely financial intermediaries, not different from other non-bank financial institutions: they gather deposits and lend these out (Fig. 1). In the words of recent authors, "Banks create liquidity by borrowing short and lending long" (Dewatripont, Rochet, & Tirole, 2010), meaning that banks borrow from depositors with short maturities and lend to borrowers at longer maturities.

The financial intermediation theory of banking is publicised by highly ranked economics journals, and also includes some well-known economists. Examples are Keynes (1936); Gurley and Shaw (1955); Tobin (1963, 1969); Sealey and Lindley (1977); Diamond and Dybvig (1983); Baltensperger (1980); Diamond (1984, 1991, 1997); Eatwell, Milgate, and Newman (1989); Gorton and Pennacchi (1990); Bencivenga and Smith (1991); Bernanke and Gertler (1995), Rajan (1998), Myers and Rajan (1998), Allen and Gale (2004a, 2004b); Allen and Santomero (2001); Diamond and Rajan (2001); Kashyap, Rajan, and Stein (2002); Matthews and Thompson (2005); Casu and Girardone (2006); Dewatripont et al. (2010); Gertler and Kiyotaki (2011) and Stein (2014).

Earlier proponents of this theory include von Mises (1912), who wrote:

> "The activity of the banks as negotiators of credit is characterised by the lending of other people's, that is, of borrowed, money. Banks borrow money in order to lend it; … Banking is negotiation between granters of credit and grantees of credit. Only those who lend the money of others are bankers; those who merely lend their own capital are capitalists, but not bankers"
>
> (Mises, 1980, p. 294f).

While Mises argued that this was only one of the functions of banks,[1] Keynes (1936) in his *General Theory* clearly states that for investments to take place, savings first need to be gathered. This view has also been reflected in the Keynesian growth models by Harrod (1939) and Domar (1947), which are based on the *financial intermediation theory of banking*, although not explicitly modelling banks. Indeed, this theory provides the justification for failing to incorporate banks and the way they operate in economic models. Harrod and Domar's conclusions have had a significant influence on economic policy in the post-war era, as their work has been interpreted to the effect that developing countries could be helped by international banks who could provide missing domestic savings through their

[1] Von Mises also pointed out that
"…those banks that issue notes or open current accounts… have a fund from which to grant loans, over and above their own resources and those resources of other people that are at their disposal"
(Mises, 1980, p. 304).
Mises (1912) thought that banks could act either as financial intermediaries, in which case they would not create money, or at times stop being financial intermediaries and function as creators of credit and money. How this should be reflected in terms of bank accounting remains unclear and doubtful. This line of thinking may, on a high level, however have prepared the ground for the idea that banks could be financial intermediaries on the one hand and on the other, somehow, create money — a position that the *fractional reserve theory* maintains.

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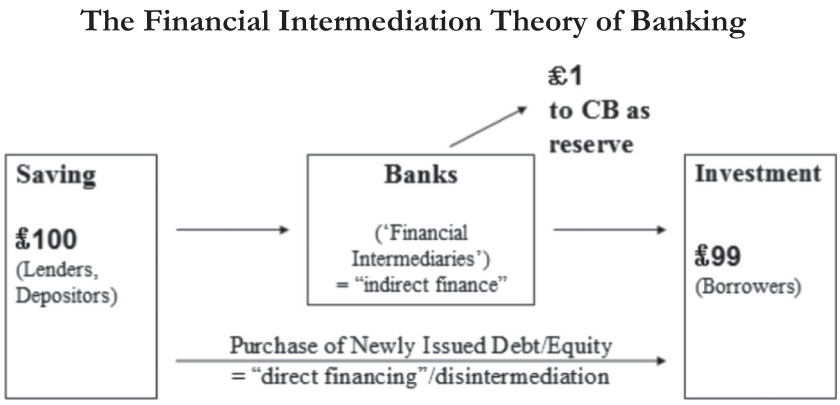

Fig. 1. The financial intermediation theory of banking.
Source: Werner (2005).

lending from abroad in order to fund economic growth. This logic has resulted in a significant increase in foreign borrowing and indebtedness by developing countries since the second world war.

Gurley and Shaw (1955, 1960) argue that banks and non-bank financial institutions largely share the function of being financial intermediaries, thus arguing that there is nothing special about banks. Tobin (1963) backed this view in his influential work. He argued:

> "The distinction between commercial banks and other financial intermediaries has been too sharply drawn. The differences are of degree, not of kind... In particular, the differences which do exist have little intrinsically to do with the monetary nature of bank liabilities… The differences are more importantly related to the special reserve requirements and interest rate ceilings to which banks are subject. Any other financial industry subject to the same kind of regulations would behave in much the same way" (p. 418).

Since in many countries, such as the UK, today there are neither interest rate ceilings nor reserve requirements for banks, Tobin's classification of banks as financial intermediaries should hold true more than ever, since he staked any differences between banks and non-bank financial intermediaries on these.

Sealey and Lindley (1977) develop a production theory for depository institutions:

> "The transformation process for a financial firm involves the borrowing of funds from surplus spending units and lending those funds to deficit spending units, i.e. financial intermediation" (p. 1252).

> "…the production process of the financial firm, from the firm's viewpoint, is a multistage production process involving intermediate outputs, where loanable funds, borrowed from depositors and serviced by the firm with the use of capital, labor and material inputs, are used in the production of earning assets" (p. 1254).

Baltensperger (1980) also believes banks are merely financial intermediaries, unable to create money, and instead engaging in a somewhat vague process of 'risk transformation':

> "The main economic functions of financial firms are those of consolidating and transforming risks on the one hand, and of serving as dealers or 'brokers' in the credit markets… on the other hand" (p. 1).

Riordan (1993) holds that

> "Banks serve as financial intermediaries between borrowers and lenders. More precisely, banks borrow from depositors and lend to investors…. In a capitalist economy most investment projects are owned and managed by private entrepreneurs and firms. Generally these investors lack enough equity fully to finance their projects and consequently seek loans to complete financing. Banks, on the other hand, aggregate deposits to make these loans" (p. 328).

Kashyap et al. (2002) believe that banks are pure financial intermediaries, presenting a model of banking in which a bank purchases assets with funds it had acquired in the form of deposits or the issuance of equity or bonds. The authors seem to be envisaging a cash-based economy, whereby deposits constitute amounts of cash paid in:

> "The total assets to be financed at date 0 are $L + S_0$. They are financed partly by demandable deposits…. In addition to deposits, the bank can also issue claims in the public market…. These claims mature at date 2, and can be thought of as either bonds or equity" (p. 41).

The more recent and substantial 'credit view' literature (such as Bernanke and Blinder, 1988; Bernanke and Gertler, 1995), the monitoring literature on financial intermediation (Diamond, 1984; Sheard, 1989), and the sizeable literature on the various other theories of financial intermediation, do not distinguish banks from other non-bank financial institutions (see, for instance, Casu et al., 2006). The authors in these branches of the literature hold that banks are just another type of financial intermediary among many, without the power to create credit in any way.

Influential textbooks on money and banking are also proponents of the *financial intermediation theory*, such as that by Cecchetti (2008), who does not consider banks able to create credit or money:

> "…an institution like a bank stands between the lender and the borrower, borrowing from the lender and then providing the funds to the borrower" (p. 39)

…or the banking textbook by Casu et al. (2006):

> "Banks, as other financial intermediaries, play a pivotal role in the economy, channelling funds from units in surplus to units in deficit. They reconcile the different needs of borrowers and lenders by transforming small-size, low-risk and highly liquid deposits into loans which are of larger size, higher risk and illiquid (transformation function)" (p. 18).

Matthew and Thompson (2005) state that banks first need to obtain deposits in order to be able to lend:

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> "Financial intermediation refers to borrowing by deficit units from financial institutions rather than directly from the surplus units themselves. Hence, financial intermediation is a process which involves surplus units depositing funds with financial institutions who in turn lend to deficit units" (p. 33).

> "An exogenous increase in the demand for loans shifts the LL schedule up to LL' and increases the loan rate. The bank (or banking system in the case of a non-monopoly bank) will respond by supplying more loans and deposits. To attract more deposits, the bank (banking system) will bid for deposits by increasing the deposit rate" (p. 110).

As there is no clear distinction of banks from non-banks in such models, economists also see no reason why banks need to be singled out for special treatment or indeed included in their macroeconomic theories at all. Thus it came to pass that the seminal articles in leading journals and widely-used macroeconomics and monetary economics textbooks have long dropped out banks entirely: banks do not feature at all in 'advanced macroeconomics' or 'advanced monetary economics' textbooks, such as the influential 785-page tome by Woodford (2003), the 820 pages of Heijdra and Van der Ploeg (2002) or the 751 pages of Sorensen and Whitta-Jacobsen (2010).

Finally, even recent popular discussions of banking, written by finance or economics professors with the hindsight of the financial crisis of 2008, continue to present banks as mere financial intermediaries:

> "…banks make their profits by taking in deposits and lending the funds out at a higher rate of interest"
>
> (Krugman, 2015).

> "The bank acts as an intermediary, channeling money from thousands of depositors and other investors to its loan clients"
>
> (Admati and Hellwig, 2012, p. 50).

> "The use of deposits to fund loans has been a standard practice in banking for centuries"
>
> (op. cit., p. 51).

> "…the use of deposits and short-term debt to fund loans has gone on for centuries and is enshrined in banking textbooks…"
>
> (op. cit., p. 51).

> "…banks benefit the economy by taking deposits and making loans. Of these two activities, deposit taking is unique to banks. Loans can also be made by any other institution that has the capacity to assess the loan applicants' creditworthiness and to monitor their performance. The concentration of banks on lending is due to ready availability of funds from deposits"
>
> (op. cit., p. 148).

2.2. The fractional reserve theory of banking

This theory of banking also argues that each bank is a financial intermediary. However, it disagrees with the former theory concerning the collective, macroeconomic role of banks: it argues that, together, the banking system creates money, through the process of 'multiple deposit expansion'. Thus when Gurley and Shaw (1955) argued that banks and non-bank financial institutions are largely similar in that they were both financial intermediaries able to 'create financial claims', they were challenged during the 1950s and 1960s in influential journals by, among others, Culbertson (1958), Aschheim (1959), Warren Smith (1959), Solomon (1959), Paul Smith (1966) and Guttentag and Lindsay (1968), many of whom were supporters of the *fractional reserve theory*.[2] Phillips' citation of the credit or money multiplier rendered him one of the earlier and most influential economists to formulate the mechanics of fractional reserve banking.[3] According to Phillips:

> "What is true for the banking system as an aggregate is *not* true for an individual bank that constitutes only one of many units in that aggregate."
>
> (Phillips, 1920, p. 40).

Crick (1927) is another supporter of this theory. He argues that while each bank is a financial intermediary, the system as a whole can create money. Like later Keynes and Tobin, Crick adopted the habit of placing the concept of creation in inverted commas ('credit "creation"'). This implies scepticism, if not even derision and ridicule for those who believe in the ability of banks to create credit. While not entirely denying the potential for banks to create credit and money, Crick (1927) and colleagues succeeded in downplaying the significance of any such action and re-assuring the public – or academia – that all was under control, as the money creation was the result of a kind of diffuse process, a technical detail that experts might debate, but which was of little direct consequence for the economic model builder.

Friedrich von Hayek's first book revealed him to be also a supporter of the *fractional reserve theory of banking* (Hayek, 1929, p. 90): He argued that with a reserve of 10%, every bank would lend out 90% of any deposit, which would increase deposits with other banks, resulting in a multiple creation of deposits in the banking system.

Meanwhile, Keynes (1930) supports the *fractional reserve theory*, citing both Phillips (1920) and Crick (1927) approvingly (p. 25). But he then discusses the concept of money 'creation' by referring to any increase in bank deposits as the 'creation' of deposits:

> "There can be no doubt that, in the most convenient use of language, all deposits are 'created' by the bank holding them. It is certainly not the case that the banks are limited to that kind of deposit, for the creation of which it is necessary that depositors should come on their own initiative bringing cash or cheques" (p. 30).

Keynes may have been referring to bank transfers as the kind of deposit that allows a bank to 'create' a deposit, while remaining a mere financial intermediary, since Keynes (1930) deploys the expression 'creation of deposits' also for the instance of a cash deposit at a bank (p. 24), arguing that:

> "only the bank itself can authorise the creation of a deposit in its books entitling the customer to draw cash or to transfer his claim to the order of someone else" (p. 24).

[2] Smith (1959), for instance, argues in the *Quarterly Journal of Economics* that banks 'can create money' and that "their credit-creating activities expand the supply of loanable funds available to finance expenditure". …

> "Commercial banks do have a special ability to expand credit for a reason that is simple but often overlooked…. What is truly unique... about commercial banks is… their distinctive role as issuers of means of payment [which] gives commercial banks a peculiar ability to expand credit" (p. 535).

Smith argues that banks are (presumably in aggregate) not financial intermediaries and their function is distinct from that of financial intermediaries (what in modern parlance is referred to as 'non-bank financial intermediaries'). According to Smith, the money creation by banks is due to a 'multiplier process' (which he also calls the "credit expansion multiplier" or "multiple credit creation"):

> "Commercial bank credit creation makes funds available to finance expenditures in excess of the funds arising out of the current income flow. Intermediaries, to the extent that their activities are as described so far, merely collect a portion of current voluntary saving and serve the function of making these funds available for the financing of current expenditures — i.e., they help to channel saving into investment in a broad sense. Thus, intermediaries are exactly what their name indicates. Commercial banks, on the other hand, are distinctly not intermediaries" (p. 538).

[3] Earlier authors include Marshall (1890).

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So 'deposit creation' "in the most convenient use of language" here is simply the act of recording a deposit in the bank's account, i.e. a bank accounting entry. If the adjustment of an account is termed the 'creation' of such an accounting record, by this definition banks are of course 'creating' entries whenever a transaction is made. However, by this definition any non-bank corporation would equally be 'creating' assets and liabilities on its balance sheet, whenever a transaction is entered into the firm's accounts. Thus Keynes' terminology does not serve to clarify.

The widely read contemporary textbook by Stiglitz (1997) also favours the *fractional reserve theory*, and mirrors Keynes' ambiguous terminology:

> "The process of multiple-deposit creation may seem somewhat like a magician pulling rabbits out of a hat: it seems to make something out of nothing. But it is, in fact a real physical process. Deposits are created by making entries in records; today electronic impulses create records on computer tapes. The rules of deposit creation are rules specifying when you may make certain entries in the books. It is these rules – in particular, the fractional reserve requirements – that give rise to the system's ability to expand deposits by a multiple of the original deposit increase"
>
> (Stiglitz, 1997, p. 737).

Again, the 'creation' of deposits and loans is defined by the creation of an accounting record. Such terminology distracts from the question whether individual banks can uniquely create new purchasing power out of nothing, and hence cause an increase in total balances without a commensurate decrease. But at least Stiglitz's adherence to the *fractional reserve theory of banking* is clear-cut.

What must be the most influential post-war textbook in economics — that by Samuelson (1948) — squarely addresses the question at hand: The original first edition deals with the third theory of banking, the *credit creation theory* and dismisses it. Under the heading "Can banks really create money?", Samuelson argues against "false explanations still in wide circulation" (p. 324):

> "According to these false explanations, the managers of an ordinary bank are able, by some use of their fountain pens, to lend several dollars for each dollar left on deposit with them. No wonder practical bankers see red when such behavior is attributed to them. They only wish they could do so. As every banker well knows, he cannot invest money that he does not have; and any money that he does invest in buying a security or making a loan will soon leave his bank" (p. 324).

Samuelson also supports the *fractional reserve theory of banking* and holds that a bank needs to gather the funds first, before it can extend bank loans. At the same time he argues that, in aggregate, the banking system creates money. He illustrates his argument with the example of a 'small bank' that faces a 20% reserve requirement and considers the balance sheet accounts of the bank. If this bank receives a new cash deposit of $1000, "What can the bank now do?", Samuelson asks (p. 325).

> "Can it expand its loans and investments by $4000 so that the change in its balance sheet looks as shown in Table 4b?"

Table 4b
Impossible situation for single small bank.

Assets		Liabilities	
Cash reserves	+$1,000	Deposits	+$5,000
Loans and investments	+$4,000		
Total	+$5,000	Total	+$5,000

Samuelson (1948, p. 325)

> "The answer is definitely 'no'. Why not? Total assets equal total liabilities. Cash reserves meet the legal requirement of being 20% of total deposits. True enough. But how does the bank pay for the investments or earning assets that it buys? Like everyone else it writes out a check – to the man who sells the bond or signs the promissory note. … The borrower spends the money on labor, on materials, or perhaps on an automobile. The money will very soon, therefore, have to be paid out of the bank. … A bank cannot eat its cake and have it too. Table 4b gives, therefore a completely false picture of what an individual bank can do" (p. 325f).

Samuelson argues that since all the money lent out will leave the bank, after loan extension the true balance sheet of this bank that has received a new deposit of $1000 will look as follows (Table 4c):

Table 4c
Original bank in final position.

Assets		Liabilities	
Cash reserves	+$ 200	Deposits	+$1,000
Loans and investments	+$ 800		
Total	+$1,000	Total	+$1,000

Samuelson (1948, p. 326)

Thus Samuelson argues that an individual bank cannot create credit out of nothing, while the banking system can do so:

> "As far as this first bank is concerned, we are through. Its legal reserves are just enough to match its deposits. There is nothing more it can do until the public decides to bring in some more money on deposit" (p. 326).
>
> "The banking system as a whole can do what each small bank cannot do!" (p. 324),

namely create money. Samuelson then describes the iterative process of a new loan by one bank becoming another bank's deposits, and so forth. He calls this a "chain of deposit creation", which shows total deposits in the banking system of $5000 having come about from an initial $1000 loan, with a reserve requirement of 20%, implying a 'money multiplier' of 5 times. As a result the consolidated balance sheet of the banking system is shown by Samuelson as follows (Table 4i):

Table 4i
Consolidated balance sheet showing final positions of all banks together.

Assets		Liabilities	
Cash reserves	+$1,000	Deposits	+$5,000
Loans and investments	+$4,000		
Total	+$5,000	Total	+$5,000

(Samuelson, 1948, p. 329)

> "If the reader will turn to Table 4b previously marked *impossible*, he will see that the whole banking system can do what no one bank can do by itself. Bank money has been created 5 for 1 – and all the while each bank has only invested and lent a fraction of what it has received as deposits!" (p. 329).

Samuelson calls this "multiple deposit expansion". This description has survived over the decades of new editions of his textbook, with the same heading: "All banks can do what one can't do alone" (p. 493), reiterated in the fifteenth edition of his book (Samuelson and Nordhaus, 1995), although the reserve requirement cited as example had been lowered to 10% (still an overstated number). The table with the 'chain' of n-th-generation banks to whom decreasing portions of deposits have moved is the same, as is the caption "All banks together do accomplish what no one small bank can do – multiple expansion of reserves…" (p. 492). Table 4i re-appears, with the same title ("*Consolidated Balance Sheet Showing Final Positions of All Banks*").

Comparing these two versions of this likely most influential economics textbook of the 20th century (1948 vs. 1995) a number of differences can be seen: The amount of space devoted to the topic of bank money creation is much smaller in 1995 compared to 1948. In the

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1995 textbook the *fractional reserve theory* is stated more clearly and unambiguously: the central bank-created reserves are said to be used by banks "as an input" and then "transformed" "into a much larger amount of bank money" (p. 490). The alternative *credit creation theory* is not mentioned: There is no equivalent of Table 4b. The idea that an individual bank might create deposits is not mentioned at all.[4] Each bank is clearly represented as a pure financial intermediary, collecting deposits and lending out this money (minus the reserve requirement)[5]:

> "Each small bank is limited in its ability to expand its loans and investments. It cannot lend or invest more than it has received from depositors" (p. 496).

So in this world, where does money (our modern bank deposit money) come from? We are told that it is "supplied" by "the financial system" in a diffuse process that each individual bank has little control over (p. 494).

Another supporter of the *fractional reserve theory*, published in a leading journal, is Whittlesey (1944), who stated that banks are "creating money" (p. 251), "exercising the sovereign function of issuing money" (p. 252), as "administrators of the money supply" and engage in "deposit creation" (p. 247) – but only collectively, not individually, in line with the *fractional reserve theory*:

> "Despite the changes that have taken place, the mechanics of banking operations are essentially similar to what they were in the past. The process, whereby deposits are created – and may conceivably be destroyed – on the basis of fractional reserves and against changes in the volume of debts held by banks, is still fundamentally the same" (p. 247).

The author is aware that the policy conclusion that bank credit creation could be considered a mechanical process that did not need to be modelled explicitly in economic theories, was dependent on a number of assumptions:

> "The rise of a large and fluctuating volume of excess reserves is significant primarily because the assumption of a fixed reserve ratio underlies, to an extent that has not, I believe, received sufficient emphasis, the entire theory of commercial banking. The conventional description of the process of deposit expansion – with reserves overflowing from Bank 1 to Bank 2 and so on up to Bank 10, thereby generating a neatly descending series of deposit growth all along the line – rests on the assumption that reserves will be fully and promptly utilized" (p. 250).

Alhadeff (1954), a staff member of the US Federal Reserve system, also invokes Phillips (1920) in supporting the *fractional reserve theory of banking*:

> "One complication worth discussing concerns the alleged "creation" of money by bankers. It used to be claimed that bankers could create money by the simple device of opening deposit accounts for their business borrowers. It has since been amply demonstrated that under a fractional reserve system, only the totality of banks can expand deposits to the full reciprocal of the reserve ratio. [Footnote: 'Chester A. Phillips, *Bank Credit* (New York: Macmillan Committee, 1931), chapter 3, for the classical refutation of this claim.'] The individual bank can normally expand to an amount about equal to its primary deposits" (p. 7).

The *fractional reserve theory of banking* is proposed in many textbooks, especially for undergraduate students (interestingly, it tends to be left out of books for postgraduates, where the *financial intermediation theory* holds sway). For instance, Stiglitz (1997) writes:

> "In this way, any new deposit into the banking system results in a multiple expansion of the number of deposits. This is the 'miracle' of the fractional reserve system. Deposits increase by a factor of 1/reserve requirement. … Note that as the deposits increased, so did the supply of outstanding loans" (p. 736)."It should be clear that when there are many banks, no individual bank can create multiple deposits. Individual banks may not even be aware of the role they play in the process of multiple-deposit creation. All they see is that their deposits have increased and therefore they are able to make more loans" (p. 737).

2.3. The credit creation theory of banking

The third theory of banking is at odds with the other two theories by representing banks not as financial intermediaries — neither in aggregate nor individually. Instead, each bank is said to create credit and money out of nothing whenever it executes bank loan contracts or purchases assets. So banks do not need to first gather deposits or reserves to lend. Since bank lending is said to create new credit and deposit money, an increase in total balances takes place without a commensurate decrease elsewhere. Therefore according to this theory, over time bank balance sheets and measures of the money supply tend to show a rising trend in time periods when outstanding bank credit grows — unlike with the financial intermediation theory, where only existing purchasing power can be re-allocated and the money supply does not rise. Supporters include Macleod (1856), Withers (1909, 1916), Schumpeter (1912), Wicksell (1898), Cassel (1918), Hahn (1920), Hawtrey (1919) and others. There were more supporters of this theory in the era of widespread bank note issuance by commercial banks, but our concern here is with writers that considered individual banks to be creators of credit and money even if they do not engage in note issuance.

The most authoritative writer supporting this theory is Henry D. Macleod (1856), who was a banking expert and barrister at law. His influential work, published in many editions until well into the 20th century (the quotes are from the 6th edition of 1906), emphasises the importance of considering accounting, legal and financial aspects of banking together. Based on an analysis of the legal nature of bank activity he concluded:

> "Nothing can be more unfortunate or misleading than the expression which is so frequently used that banking is only the "Economy of Capital," and that the business of a banker is to borrow money from one set of persons and lend it to another set. Bankers, no doubt, do collect sums from a vast number of persons, but the peculiar essence of their business is, not to lend that money to other persons, but on the basis of this bullion to create a vast superstructure of Credit; to multiply their promises to pay many times: these Credits being payable on demand and performing all the functions of an equal amount of cash. Thus banking is not an Economy of Capital, but an increase of Capital; *the business of banking is not to lend money, but to create Credit*: and by means of the Clearing House these Credits are now transferred from one bank to another, just as easily as a Credit is transferred from one account to another in the same bank by means of a cheque. And all these Credits are in the ordinary language and practice of commerce exactly equal to so much cash or Currency (Macleod, 1906, vol. 2, p. 311, italics added)".[6]

[4] Furthermore, unlike the original Samuelson (1948), the more recent textbook mentions nowhere that in terms of its operations an individual bank might also be able to 'create deposits' (even though it might then lose the money quickly), which can be said, somewhat contradictorily, to support the *credit creation theory*.

[5] Moreover, the original Samuelson (1948: 331) offered an important (even though not prominently displayed) section headed 'Simultaneous expansion or contraction by all banks', which provided the caveat that each individual bank could, after all, create deposits, if only all banks did the same at the same rate (thus outflows being on balance cancelled by inflows, as Alhadeff, 1954, also mentioned). There is no such reference in the modern, 'up-to-date' textbook.

[6] Also: "We have seen that all Banking consists in creating and issuing Rights of action, Credit, or Debts, in exchange for Money, or Debts. When the Banker had created this Liability in his books, the customer might, if he pleased, have this Credit in the form of the Banker's notes. London bankers continued to give their notes till about the year 1793, when they discontinued this practice, and their customers could only transfer their Rights, or Credit, by means of cheques. But it is perfectly manifest that the Liabilities of the Bank are exactly the same whether they give their own notes or merely create a Deposit" (MacLeod, 1906, p. 338).

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"…the Credit [the banker] creates in his customer's favour is termed a Deposit. (p. 406).

"These banking Credits are, for all practical purposes, the same as Money. They cannot, of course, be exported like money: but for all internal purposes they produce the same effects as an equal amount of money. They are, in fact, Capital created out of Nothing "

(Macleod, 1906, p. 408).

Macleod's message was spread far and wide by Withers (1909, 1916), who was a prolific writer about this topic and for many years editor of the *Economist*:

"In old times, when a customer went to a banker for a loan, the banker, if he agreed, handed him out so many of his own notes; now when a customer goes to a banker for a loan, the banker gives him a credit in his books, *i.e.* adds to the deposits on the liability side of the balance sheet"[7]

(Withers, 1916, p. 42).

According to the *credit creation theory* then, banks create credit in the form of what bankers call 'deposits', and this credit is money. Another influential proponent of this theory was Schumpeter (1912):

"The function of the banker, the manufacturer of and dealer in credit, is to select from the gamut of plans offered by entrepreneurs… enabling one to implement their plans and denying this to another"[8]

(Schumpeter, 1912, p. 225).

Schumpeter (1954) argued against the alternative theories of banking:

"this alters the analytic situation profoundly and makes it highly inadvisable to construe bank credit on the model of existing funds being withdrawn from previous uses by an entirely imaginary act of saving and then lent out by their owners. It is much more realistic to say that the banks 'create credit', that is, that they create deposits in their act of lending, than to say that they lend the deposits that have been entrusted to them. And the reason for insisting on this is that depositors should not be invested with the insignia of a role which they do not play. The theory to which economists clung so tenaciously makes them out to be savers when they neither save nor intend to do so; it attributes to them an influence on the 'supply of credit' which they do not have. The theory of 'credit creation' not only recognizes patent facts without obscuring them by artificial constructions; it also brings out the peculiar mechanism of saving and investment that is characteristic of fully fledged capitalist society and the true role of banks in capitalist evolution" (p. 1114).

US supporters of this theory include Davenport (1913) and Howe (1915):

"…banks do not lend their deposits, but rather, by their own extensions of credit, create the deposits"

(Davenport, 1913, p. 263).

"Banks do not loan money. They loan credit. They create this credit and charge interest for the use of it. It is universally admitted that the old State Banks that created credit in the form of bank notes, created currency – and our modern system of creating credit in the form of "Deposits" which circulate in the form of bank checks, is doing exactly the same thing – creating currency.

"All this in effect nullifies the National Banking Act, which provides for National Bank Currency based on U.S. Government Bonds, and also the act levying an annual tax of 10% on all State Bank Currency….

"The public little realizes to what an extent Bank Credit, circulating in the form of bank checks, has supplanted all other circulating media. In 95% of all the business done in the United States, the payments are made in bank checks and in only 5% is any cash used; and of this 5% an infinitesimal fraction only is gold

(Howe, 1915, p. 24f).

"The introduction of bank notes was useful in weaning the public from the use of gold and silver coins, and prepared the way for the introduction of Bank Credit as the means of payment for commodities. As a result of this evolutionary process, the checks drawn and paid in the United States amount to between two hundred billion and two hundred and fifty billion dollars a year. It is clear that it would be a physical impossibility to do this amount of business by the use of gold coin. There is only about eight billions of gold money in the world, of which amount less than two billions of dollars are in the United States.

"The banks have created fifteen billions of dollars of credit by discounting the notes of merchants and manufacturers, and crediting the proceeds to the borrower's account under the head of Deposits. As a result, the borrower is enabled to draw checks and pay his debts with them

(Howe, 1915, p. 25).

Swedish economist Gustav Cassel (1923) pointed out that

"In practice, deposits are also created and constantly fed by the bank's granting advances to its customers, either by discounting bills or by making loans and then crediting the clients with the amount in

[7] "It is true that the customer does not leave the deposit there but draws cheques against it, which he pays to people to whom he owes money. But these cheques, if paid to recipients who also bank at the bank which has made the advance, would simply be a transfer within the bank's own books, and the effect of the transaction upon its balance sheet would be that it would hold among its assets an increase – if the loan was for £100,000 – of this amount among its advances to customers; and on the liability side there would be a similar increase in the deposits. … and if we could look at an aggregate balance sheet of the whole of the banks of the country we should see that any increase in loans and advances would have this effect of increasing the deposits as long as those who receive these banking credits make use of them by drawing cheques against them. In the comparatively rare cases where the borrower makes use of the credit by drawing out coin or notes from the bank, then the first effect would be that the bank in question would hold a smaller amount of cash among its assets and a larger amount of advances to customers. But even here the currency withdrawn would almost certainly come round again, either to this bank or another, from the shopkeepers or other people to whom the borrower had made payments. And so the cash resources of the banks as a whole would be restored to the original level, while the deposits, owing to the increase at the credit of the shopkeepers and others who had paid the money in, would be added to the amount of the advance originally made. (p. 42f)

"Exactly the same thing happens when, for example, in times of war the banks subscribe to loans issued by the Government, whether in the form of long-dated loans, such as the recent War Loan, or in the form of shorter securities, such as Exchequer Bonds, Treasury Bills or Ways and Means Advances. (p. 43).

"It follows that the common belief that a great increase in bank deposits means that the wealth of the community has grown rapidly, and that people are saving more money and depositing more with the banks is, to a certain extent, a fallacy. A rise in bank deposits, as a rule, means that the banks are making large advances to their customers or increasing their holding of securities, and so are granting a larger amount of book-keeping credit, which appears as a liability to the public in the shape of deposits. (p. 44)

"It may be objected that the deposits have to come first before the banks can make advances. Does this necessarily follow? (p. 44)

[8] "Die Funtion des Bankiers, des Produzenten von und Händlers mit Kredit, ist in der Fülle der sich darbietenden Unternehmerpläne eine Auswahl zu treffen, die allen Lebensverhältnissen der Volkswirtschaft entspricht, dem einen die Durchführung zu ermöglichen, dem andern zu versagen" (Schumpeter, 1912, S. 225). Translated by author.

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their accounts" (p. 414).[9]

An important difference to the *fractional reserve theory of banking* is the use of singular in the above sentence: it is one bank that is able to create deposits. Hawtrey (1919), mirroring Macleod's (1856) exposition, also argued that banks create money out of nothing. The early Keynes was another prominent supporter of the *credit creation theory*, praising it enthusiastically in the early 1920s as an

> "almost revolutionary improvement in our understanding of the mechanism of money and credit and of the analysis of the trade cycle, recently effected by the united efforts of many thinkers, and which may prove to be one of the most important advances in economic thought ever made"
>
> (Keynes and Moggridge, 1983, p. 419, as quoted by Tily, 2012).

Keynes gives the impression of a recent convert whose eyes had been opened. In his *Treatise on Monetary Reform* (1924) Keynes was also unambiguous about the ability of banks to expand or diminish "the volume of credit quoted" (p. 137):

> "The internal price level is mainly determined by the amount of credit created by the banks, chiefly the Big Five; … The amount of credit, so created, is in its turn roughly measured by the volume of the banks' deposits — since variations in this total must correspond to variations in the total of their investments, bill-holdings, and advances" (op. cit., p. 178).

Yet, his later support for the other theories indicates that Keynes was not settled in his views on the *credit creation theory of banking*. Indeed, there is some evidence that he may have been open to the implication of the fractional reserve banking theory that high powered money is a key driving factor:

> "Thus in one way or another the banks generally adjust their total creation of credit in one form or another (investments, bills, and advances) up to their capacity as measured by the above criterion; from which it follows that the volume of their 'cash' in the shape of Bank and Currency Notes and Deposits at the Bank of England closely determines the volume of credit which they create" (op. cit., p. 179).

A clearer statement coming from Keynes' pen can be obtained from the final report of the Committee on Finance and Industry, commonly known as the Macmillan Committee (1931), after its chairman, Hugh Macmillan.[10] The Committee gathered much evidence, mainly in the form of first-hand eye-witness testimonies, and quickly identified bank credit creation as a central focus of their inquiry.[11] It must be considered as one of the most thorough and wide-ranging investigations of banking and finance in the modern age conducted by such a broad group of stakeholders. The final report, submitted in June 1931, contained a number of statements on the question at hand. It is said to have been drafted and significantly influenced by Keynes, one of the committee members. The following statement expressly refers to bank accounting of an individual bank:

> "It is not unnatural to think of the deposits of a bank as being created by the public through the deposit of cash representing either savings or amounts which are not for the time being required to meet expenditure. But the bulk of the deposits arise out of the action of the banks themselves, for by granting loans, allowing money to be drawn on an overdraft or purchasing securities a bank creates a credit in its books, which is the equivalent of a deposit" (op. cit., p. 34).

The last sentence uses the singular: a loan from one bank results in credit creation, which is the "equivalent" of deposit creation, amounting to the size of the loan. If the bank was a financial intermediary, it would not newly create the deposit of the borrower, but transfer the funds from another account, either inside or outside the bank. This is most clearly seen

> "If no additional in-payments were made by customers and there were no withdrawals in cash," because then "the volume of deposits of a single banker would fluctuate only with the volume of the loans he himself made…" (op. cit., p. 12).

The *credit creation theory of banking* also featured prominently in textbooks, training a new generation of economists and policy makers well into the 1930s: The US textbook on monetary economics by James (1930) was unambiguous and confident in the assessment that

> "… the bank is enabled to make loans to an amount many times larger than the sum of cash which has been deposited with it, and it will already have become apparent that *the greater part of the items appearing on the liabilities side of the balance sheet, under the heading of deposits, is created, not as a result of cash deposited with the bank by customers, but through the making of loans or discounts by the bank* to those customers. …"
>
> "…the bank has monetized credit. *It has created purchasing power which did not exist before*, since it has supplied the borrower with a means of paying his debts, without in any way reducing the amount of money in the hands of the other members of the community. Each addition to the existing volume of bank loans, therefore, results in a net increase in the total supply of money in the community, and any diminution in that volume will decrease the total volume of money"
>
> (James, 1930, 194f, italics in original)

While the star of the *credit creation theory* was on the descent in the mid-1930s, as the *fractional reserve theory* became dominant, a leading – if not *the* leading-monetary economist of his day, Irving Fisher, still insisted on the veracity of the *credit creation theory*:

> "When a bank grants me a $1000 loan, and so adds $1000 to my checking deposit, that $1000 of 'money that I have in the bank' is new. It was freshly manufactured by the bank out of my loan and

[9] This quote is from the English translation of the fifth German edition of the 1918 book, both published in 1932.

[10] The committee was appointed by the Chancellor of the Exchequer in November 1929 to

> "inquire into banking, finance and credit, paying regard to the factors both internal and international which govern their operation, and to make recommendations calculated to enable these agencies to promote the development of trade and commerce and the employment of labour" (p. 1).

It consisted of leading experts, opinion-leaders and stakeholders of the day, including John Maynard Keynes and Professor T. Gregory, professor of Banking at the LSE, treasury and Bank of England representatives and senior executives of banks, but also a union representative, a representative of the cooperative movement and a politician. Over almost two years the Committee held 49 meetings and interviewed 57 witnesses, reflecting "a wide and varied range of representatives of banking and finance, both in this country and in the United States and Germany, as well as of industry and commerce from the point of view both of employers and of employed, while members of the Universities and the Civil Service and eminent economists of diverse schools have also lent their assistance" (p. 1). This included Mantagu Norman, the governor of the Bank of England, Professor A. Pigou of Cambridge University, as well as senior representatives from Barclays Bank, Midland Bank, Lloyds Bank, National Provincial Bank, Westminster Bank, the Scottish banks and the Treasury, and such internationally active banking insiders as Otto Ernst Niemeyer and Henry Strakosch.

[11] In his opening words to witness Josiah Stamp, chairman Lord Macmillan stated: "You appreciate that our main preoccupation is with the question of the basis of credit as affecting industry and employment…" (Macmillan Committee, 1931, appendix, witness transcripts, p. 238, question 3710).

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written by pen and ink on the stub of my check book and on the books of the bank... Except for these pen and ink records, this 'money' has no real physical existence"

(Fisher, 1935, p. 3).

Despite being dominated by the other two theories in subsequent decades, pockets of adherents to the *credit creation theory of banking* continued to exist and even thrive, most notably among so-called 'Austrian' economists (since the post-war era largely active in the US), post-Keynesian economists and the inductive-empiricist school.

Examples of the Austrian writers whose views appear consistent with the credit creation theory of banking are Hoppe, Hülsmann and Block (1998). Post-Keynesian writers that have postulated the ability of banks to create credit and money include Rochon and Rossi (2003) and Basil Moore. The latter wrote:

"When a bank grants a loan to one of its customers, it simply credits the amount to the borrower's account"

(Moore, 1988, p. 51).

Moore (1988) also argued against the *fractional reserve theory*, although his choice of the word 'bank intermediation' is not ideal:

"Contrary to conventional wisdom, changes in reserve requirements imposed by the central bank do not directly affect the volume of bank intermediation"

(op. cit., p. 65).

Since the early 1990s, the methodological approach to base economic research not on preconceived theories (the deductive method), but on empirically gained knowledge (the inductive method), has gained credence (see Werner, 1992, 1997, 2005). Employing this approach, Werner (1997) writes:

"…banks create new purchasing power by the extension of loans" (p. 282).

Consistent with this insight, it was also suggested to deploy bank credit information in macroeconomic models:

"Using total bank credit as the measure of the 'money supply' in [the] equation [of exchange] has the advantage that (a) credit always represents *effective* purchasing power, as no borrower will take out a loan if there is no loan to use the money for transactions; (b) it becomes possible to define effective purchasing power clearly – namely not bank liabilities, but bank assets or private sector liabilities to the bank sector; and (c) credit aggregates are available by economic sector and hence provide us with additional information about the direction of purchasing power – something deposit aggregates cannot tell us" (op. cit., p. 283).

The empirical evidence in favour of this disaggregated Quantity Theory of Credit was overwhelming, when a general-to-specific downward reduction from a general model of a major economy was conducted, which included variables from competing theories:

"We found that key economic variables, namely nominal GDP, asset prices and Japanese foreign investment, could be explained single-handedly with quantity variables – the quantity of disaggregated credit – while interest rates and exchange rates dropped out in parsimonious reductions as insignificant. … This opens a whole new avenue of promising work in the new research programme of the macro-economic role of credit" (Werner, 1997, p. 305).

Werner (2005) asks where a bank gets the money from which it credits a borrower's account with:

"The money was not withdrawn by the bank from other uses. It was not diverted or transferred from any other part of the economy. Most of all, although it is shown as a deposit, it was not actually deposited by anyone. The bank simply created the money by writing the figures into its books and the customer's account book. In effect, the bank pretends that its borrower has made a deposit that was not actually made. Unlike the textbook representation, we see that each individual bank can thus create money when it extends a loan. *Showing this truth in textbooks would not only be more memorable, but it would also teach students about what banks really do: they create money out of nothing. The bank just pretends it has the* [*loan amounts*], *credits someone's books with them, and nobody knows the difference*" (p. 178).

Finally, it should be repeated that the *credit creation theory* does not feature in most contemporary economics, finance or banking textbooks.[12]

2.4. Assessment

From the above review of the literature, together with that in Werner (2014b), it can be said that despite today's dominance of the *financial intermediation theory*, the question whether banks create money and are thus 'unique' still "remains unsettled". That was the conclusion by Guttentag and Lindsay (1968, p. 992) almost half a century ago in their *Journal of Political Economy* article, and it has remained true until recently. The situation has not been helped by the fact that many influential economists have been sidestepping the issue, while some eminent authors that addressed it, such as Keynes, supported all three mutually exclusive theories at one point or another. A new standard of ambiguity is set by the Bank of England, which currently appears to be supporting all three theories at the same time:

Most central banks have been active proponents and supporters of the *financial intermediation theory of banking*, helping it become dominant also in the academic world over the past forty years or so. Senior staff at the Bank of England continue to endorse it: Governor Mark Carney (2014) in his Mais Lecture at the Cass Business School cited the monetary theory of Brunnermeier and Sannikov (2015) in support of his arguments. The abstract of this paper makes clear that they believe banks are financial intermediaries that

"take deposits from …households to extend loans…" so that banks "finance themselves by borrowing from households" (p.1).[13]

In late March 2014, external member of the Financial Policy Committee of the Bank of England, Dame Clara Furse, explained:

"The financial system performs vital functions for us all – it exists to intermediate savings and investment… Banks, non-banks and markets all contribute to this…"

(Bank of England, 2014c).

The FPC member argues that for economic growth to take place, bank activity can be substituted by 'direct finance', and she recommends, as one of the lessons of the crisis, to enhance 'market based finance', i.e. funding via channels other than banks. Other economists at the Bank of England also seem supporters of the *financial intermediation* or the *fractional reserve theory of banking*, as can be seen from the Bank's forecasting models, which do not include banks (Bank of England, 2014d).

[12] Ryan-Collins et al. (2011) is being used as textbook, and is thus an exception.

[13] As a result, in their model banks are pure intermediaries: "Intermediaries can take deposits from unproductive households to extend loans to entrepreneurs" (p. 6). In this model, banks could not be anything but intermediaries, because there is no money creation whatsoever ("Assume there is a fixed supply of infinitely divisible money", p. 5). Whether such a model is appropriate for a central bank engaged in 'quantitative easing' is an interesting question.

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Yet, possibly triggered by the recent inroads of the *credit creation theory of banking* (Werner, 1992, 1997, 2005, 2012, 2014b; Ryan-Collins et al., 2011, Benes and Kumhof, 2012), the Bank of England in March 2014 suddenly came to additionally endorse this alternative theory (Bank of England, 2014a, b).

This means that staff at the Bank of England currently support all three of the theories of banking at the same time (see also Zoltan and Kumhof, 2015). Since each theory implies very different approaches to banking policy, monetary policy and bank regulation, the Bank of England's credibility is at stake.

One reason why the dispute still remains unsettled after such a long time is that discussions had been based on assertions, implying different accounting operations of banks. But the respective merit of the three theories cannot be settled in theoretical models designed from first principles: theoretical worlds might be conceivable in which each theory is plausible. Instead, the dispute can be settled through empirical evidence on the actual operations and accounting practices of banking. Surprisingly, in the observation period – from the mid-19th century until 2014 – no scientific empirical test had been reported in the peer reviewed journals.

The first empirical test published in a learned journal on this issue was Werner (2014b): With the cooperation of a bank, the operations and accounting entries were examined that take place when a 'live' bank loan is granted and paid out. Only the credit creation theory was consistent with the observed accounting records. The test design however did not allow a fully controlled environment: With bank operations taking place virtually 24 hours a day, it was unavoidable that other transactions would be booked in addition to the test transaction (although no other bank loan was granted). Thus a number of aggregated uncontrolled factors had to be jointly evaluated. Therefore as a robustness check it would be desirable to test the three theories of banking using a different testing procedure, in a fully controlled environment, without the potential interference from other transactions.

In order to allow complete control of all other factors, the IT system at the heart of banking operations – which incorporates bank accounting and operational rules – could be taken off-line and a loan transaction could be booked in the system. While humans may change their behaviour in such simulations when they become aware that a 'mere' test is taking place, there is no such problem when using the regular banking software.

3. A controlled empirical test

3.1. Predictions of the three theories

Before the test is conducted, the predictions of each theory about how the extension of a new €200,000 bank loan would be recorded are stated for convenience:

3.1.1. Accounting implications of the financial intermediation theory

According to this theory, banks are not different from non-bank financial institutions, such as stock brokers or asset management companies, except concerning reserve requirements, capital adequacy or interest rate regulations, as the case may be. Non-bank financial institutions are required by Client Money rules (see CASS in FCA and PRA, 2014) to hold deposits in custody for customers (a form of warehousing or bailment), by placing them with other banks or the central bank. Banks are said by this theory to be in the same position in this respect as non-bank financial institutions. In this case customer deposits are not shown on the balance sheet as liabilities (see Werner, 2014c). All funds are central bank money that can be held in reserve at the central bank or deposited with other banks or financial intermediaries (where they are also held off-balance sheet).

When a loan is granted, the claim on the borrower arising from the loan contract is shown as an increase in assets. However, the payment of the loan involves the drawing down of funds, such as reserves held at central banks, or client money held at other banks. According to this theory, the bank balance sheet does not lengthen as a result of the bank loan, just as is the case with non-bank financial intermediaries (Table 4).

Table 4
Account changes due to a €200,000 bank loan (*Financial Intermediation Theory*).

Assets		Liabilities	
Excess Reserves…	–€ 200,000		…….
Loans and investments….	+€ 200,000		
Total……	0	Total……	0

3.1.2. Accounting implications of the fractional reserve theory

According to this theory each individual bank is a financial intermediary. Funds are being treated as equivalent to cash or precious metals in the sense that they are thought to have the ability to flow between banks and the central bank. Following Samuelson's description of the *fractional reserve theory*, new loans are granted based on new deposits. With a reserve requirement of 1%, a bank would thus first need to receive a new deposit of €202,000 in order to extend a loan of €200,000. The bank's balance sheet should first show an increase in deposits large enough to accommodate the loan and the reserve requirement (Table 5).

Table 5
Account changes due to a €200,000 bank loan (*Fractional Reserve Theory, Samuelson Version*).

Assets		Liabilities	
Cash reserves……	+€ 2,000	Deposits……	+€202,000
Loans and investments….	+€200,000		
Total……	+€202,000	Total……	+€202,000

As the table shows, the balance sheet increases. This is however not due to the extension of the loan, but due to the receipt of a new deposit. This becomes clear when breaking Samuelson's description up into two steps — the receipt of the deposit, and the extension of the loan (Table 6).

Table 6
Account changes due to a €200,000 bank loan (*Fractional Reserve Theory, Samuelson Version*).

Step 1: Receipt of new cash deposit of €202,000

Assets		Liabilities	
Cash reserves……	+€202,000	Deposits……	+€202,000
Loans and investments….			
Total……	+€202,000	Total……	+€202,000

Step 2: Extension of new loan of €200,000

Assets		Liabilities	
Cash reserves……	–€ 200,000	Deposits……	+€ 0
Loans and investments….	+€200,000		
Total……	+€ 0	Total……	+€ 0

Adding up the changes in step 1 and step 2, we obtain the total change of Table 5 above.

As can be seen, for this fractional reserve model to work, Samuelson is assuming that the new deposit is a cash deposit, and the extension of the loan takes the form of paying out cash. This is hardly realistic, since bank loans are rarely paid out in cash. A more fundamental flaw is that if each individual bank was merely a financial intermediary, as is claimed according to this theory, it could not actually hold client deposits on its balance sheet — but this is what proponents of this theory have maintained (see the discussion of Samuelson or others above, or as shown in Tables 5 or 6): in the UK, according to the Client Money rules, financial intermediaries have to hold client money off-balance sheet (Werner, 2014c). This already makes it clear that banks could not possibly be mere financial intermediaries and that their accounting would

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have to be different from that of non-banks — contradicting Tobin's claim that only reserve requirements and interest rate regulations (and even if updated to include capital requirements) distinguish banks from non-banks.

3.1.3. Accounting implications of the credit creation theory

According to this theory, banks do not separate customer funds from own funds. Thus when lending, banks are able to credit the borrower's account with the borrowed amount, although no new deposit has taken place (credit creation out of nothing, Werner, 2014c). The balance sheet lengthens due to the extension of the loan, while neither cash, nor central bank reserves nor balances with other banks are needed (reserve and capital requirements only need to be met at particular measurement intervals and are not a physical precondition of granting a loan). In other words, a bank can extend a new loan, even though it has not received any new deposit money or reserves. The borrower's account is credited with the amount of the loan, although there has been no commensurate equal reduction in balance of any other account, as would be the case had the funds been transferred. Thus bank loans create new deposits, not the other way round (Table 7).

Table 7
Account changes due to a €200,000 bank loan (*Credit Creation Theory*).

Assets		Liabilities	
Loans and investments….	+€ 200,000	Deposits (borrower's A/C).	+€ 200,000
Total……	+€ 200,000	Total……	+€ 200,000

To test the veracity of the three theories, the balance sheet of a bank needs to be examined before and after the extension of a bank loan, ideally under fully controlled circumstances. If the bank loan increased the balance sheet, while no further reserve or deposit movement took place, then the credit creation theory would be shown to be consistent with the evidence, while the other two theories would be rejected.

3.2. The test

The first empirical test of the three theories of banking, reported by Werner (2014b), involved taking out an actual bank loan from a bank that was co-operating with the investigation and shared its internal records, so that it was possible to reconstruct how the loan extension was accounted for. Raiffeisenbank Wildenberg e.G., a cooperative bank in Lower Bavaria, Germany, co-headed by director Marco Rebl, kindly cooperated in the conduct of this empirical test. As this was a 'live test' and not a controlled experiment, other transactions by bank customers continued to take place during the observation period. Due to the facilities offered by modern 24-hour electronic banking, it is very difficult for researchers to control such a test, as other transactions are likely to take place during the same time period.

Considering this issue, bank director Rebl suggested a method of testing which would allow the researcher to control for all other transactions without fail. Mr. Rebl explained that all bank accounting takes place within the IT system that is used on a daily basis by bank staff. Although the code of the software would directly show the commands following the entry of a bank loan, gaining access to the internal software code is difficult even for senior bank staff, given the high security requirements of bank IT systems that are themselves usually offered by external providers reluctant to allow outsiders access to details of the software. However, Mr. Rebl then pointed out that there are in fact two parallel IT systems in operation at all Bavarian cooperative banks, and both contain the accounting information of each bank. The daily balance sheet and reporting software used in the first empirical test is based on the software called 'BAP Agree' (Bankarbeitsplatz Agree). This software is however not used for the compilation of the formal annual accounts of the banks, which are submitted to bank auditors and the regulatory authorities. For these formal accounts, a second, parallel system is utilised, called Hersbrucker Jahresabschlußprogramm (below 'HJAP'; literally: Hersbruck annual accounts programme, named after the town where the Raiffeisen cooperative bank is located whose director, Mr. Weidinger, originally developed this programme). Mr. Rebl pointed out that the HJAP system contains all the bank accounting rules and functions, and that it conforms with all bank supervisory, prudential and legal requirements, regulations and procedures (which may not necessarily be relevant or enforceable on a daily basis as applied by BAP Agree in day-to-day use). Meanwhile, HJAP meets the more stringent annual reporting requirements and features functions that are useful for the compilation, checking and submission of these accounts to regulators.

All transactions are aggregated in HJAP for the annual accounts at the end of the calendar year. While transactions booked in BAP automatically feed into HJAP, sometimes transactions take place late in December that were not properly recorded or reflected in the BAP Agree system, for instance due to the holidays. In this case, the bank directors have the opportunity to ensure that these omitted transactions are booked by manual entry in the HJAP system even after the end of the calendar year.

Thus Mr. Rebl suggested the following test design: using the latest annual accounts (at the time of conducting the test these were the 2013 annual accounts) and using the latest HJAP software (at the time of writing, 2.0.2013/5), a test bank loan of €200,000 can be booked as if it was a missed trade that had to be booked manually after 31 December 2013, to be added to the official accounts for reporting purposes. Since in this case only one transaction will be booked – the bank loan from the researcher – there is no noise due to other autonomous transactions undertaken by other bank customers. In other words, all other factors are controlled for. Meanwhile, since the software is designed to allow such a possibility, all standard procedures and regulations are applied and this manual entry function in no way overrides the system, but is a regular part of it. Since the bank loan can be entered into the HJAP system by the researcher after the end of 2013 in exactly the same way as a genuine, actual missed trade, as indeed happens on occasion with standard loans, this does constitute a realistic empirical test. This test design was adopted and the procedure was implemented as suggested by Director Rebl in 2014, using the audited accounts of 2013.

Appendix 1 shows the original audited and formally submitted accounts of Raiffeisenbank Wildenberg for the year 2013. Appendix 2 shows the same accounts after the simulation bank loan of €200,000 has been transacted via the same annual reporting bank IT software (HJAP). The summary accounts are shown (assets in Table 8 and liabilities in Table 9), whereby the first column represents the original 2013 annual accounts, the second column the new accounts after the loan has been added, and the third column shows the Difference items between the first two columns.

Table 8
Raiffeisenbank Wildenberg e.G.: Annual Accounts 2013, Assets.

Assets in EUR	31 Dec. 2013	Post-test	Difference
1 Cash	227,072.87	227,072.87	
2 Bills of exchange			
3 Claims on financial. inst.	6,123,707.01	6,123,707.01	
4 Claims on customers	24,066,899.94	24,266,899.94	200,000.00
5 Bonds, bills, debt instr.	19,655,934.00	19,655,934.00	
6 Stocks and shares			
7 Stake holdings	397,768.68	397,768.68	
8 Stakes in related firms			
9 Trust assets	4,713.81	4,713.81	
10 Compensation claims on the public sector			
11 Immaterial assets			
12 Fixed assets	188,977.92	221,549.46	
13 Other assets	335,969.95	335,969.95	
14 Balancing item	2,126.22	2,126.22	
15 Difference from asset valuations	46,334.50	46,334.50	
16 Sum of assets	51,049,504.92	51,249,504.92	200,000.00

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Table 9
Raiffeisenbank Wildenberg e.G.: Annual Accounts 2013, Liabilities.

Liabilities in EUR	31 Dec. 2013	Post-test	Difference
1 Claims by financial inst.	5,265,491.16	5,265,491.16	
2 Claims by customers	41,462,424.00	41,662,424.00	200,000.00
2A Savings accounts	*10,494,856.16*	*10,494,856.16*	
2B Other liabilities	*30,967,567.84*	*31,167,567.84*	*200,000.00*
BA daily	*14,069,056.09*	*14,269,056.09*	*200,000.00*
BB with agreed maturity	*16,898,511.75*	*16,898,511.75*	
4 Trust liabilities	4,713.82	4,713.82	
5 Other liabilities	33,812.09	33,812.09	
6 Balancing item	12,787.37	12,787.37	
7 Reserves	682,874.80	682,874.80	
11 Fund for bank risk	420,000.00	420,000.00	
12 Own capital	3,167,401.68	3,167,401.68	
13 Sum of liabilities	51,049,504.92	51,249,504.92	200,000.00

In the assets listed in Table 8, the only two items that are affected are the claims on customers – the bank loan as a claim by the bank on the borrower due to the borrower's obligation to repay the loan – and the total balance of assets. Both increased by the loan amount of €200,000.

Considering liabilities in Table 9, we see that customer deposits ('claims by customers') increased by €200,000 (i.e. current account deposits — daily liabilities), as well as the balance sheet total. Thus we conclude that the variation in accounts before and after the loan has been extended is identical with the a priori expectation according to the *credit creation theory*. As no actual deposit (or reserve increase) took place, the *fractional reserve theory* is rejected. As customer deposits are shown on the balance sheet, the *financial intermediation theory* is also rejected.[14]

Mr. Rebl, himself a trained bank auditor, confirmed that standard procedures had been followed and no other transaction or operation was necessary to complete the booking of the loan and finalise the accounts.

4. Evaluation: Lack of rigour as a cause of confusion

The core activity of banking, what is commonly called 'receiving deposits' and 'lending', are in actual fact the creation and maintenance of accounting records and thus can be considered a form of applied accounting. However, this feature of banking has been unduly neglected in the treatment of banks and their impact on the economy by academic authors, whether in journal articles, books or text books.

There are three theories of banking, with differing claims about how bank accounting, and hence banking, operates. In this paper the results of an empirical test were presented, whereby a loan from a bank was booked in the bank's accounting IT system under controlled conditions that excluded unrelated transactions. It is found that the *credit creation theory of banking* is consistent with the empirical observations, while the other two theories are not.

4.1. Flaws of the financial intermediation theory

The financial intermediation theory argues that banks are indistinguishable in their accounting from non-bank financial intermediaries (Tobin or others have argued that reserve requirements, regulations of interest rates, and capital requirements are the sole distinguishing feature of banks).

Stock brokers do not show their clients' assets, even if invested by them on a discretionary basis, as part of their own balance sheets. The assets owned by mutual fund management firms and the assets of their fund investor clients are kept completely separately. Stock brokers' assets are boosted by their own investments, but not those of their clients. Thus an insolvency of a stock broker or fund management firm leaves client funds unencumbered: they are fully owned by the clients. But bank 'deposits' are owned by the banks and bank insolvency means that the client funds are part of the assets of the bankrupt firm. Depositors are merely general creditors, ranking ahead of shareholders (although smaller amounts may be covered by deposit insurance schemes, which is a separate issue). However, due to the new Bail-In regime agreed by the G20 in 2010, depositors may rank below other creditors. Thus a comparative analysis of stock brokers (as representative examples of non-bank financial intermediaries) and banks reveals that banks are different from non-banks, because they do not segregate client assets (Werner, 2014c).

Since non-bank financial intermediaries, which can also gather deposits, have to follow the Client Money rules and keep customer deposits off their balance sheet, deposited safely with custodians, an equal treatment for banks would mean that banks would also have to conform to Client Money rules. As a result, bank deposits would not appear on the bank's balance sheet. In reality they do, however, appear on bank balance sheets with their creation, contributing to the phenomenal growth in bank assets in the recent decades. Thus the critical distinguishing feature of banks is their exemption from Client Money rules and hence ability to control the accounting records of customers' deposits, enabling them to add fictitious deposits when extending a loan (Werner, 2014c). A rigorous application of basic accounting and financial regulation would have provided ample notice to supporters of the *financial intermediation theory*, so dominant over the past half-century, that this theory has always been a non-starter, since banks could not possibly be financial intermediaries: how else could the rapid growth and massive scale of their own balance sheets be explained? Alas, it seems researchers in banking, finance and economics have woefully neglected basic accounting realities and easily observable facts.

4.2. Flaws of the fractional reserve theory

The fractional reserve theory maintains that banks are financial intermediaries that can only lend out money previously deposited with them. According to this theory, a prior customer deposit or an increase in reserves are the necessary step for a bank to be able to extend a loan, and this is effectively assumed to take the form of a cash deposit by a customer. This produces an excess cash reserve, which is then used to fund a loan. The borrower is then assumed to receive the loan in the form of cash, drawing down the excess cash balance.

As it turns out, this theory neglects, despite its rhetorical awareness of the 'creation of accounting records', the very transaction of booking a loan on the bank's balance sheet: the borrower's account is not shown, as it is simply assumed that the money 'leaves the bank immediately', on the implicit assumption that the loan is paid out in cash. But normally banks will not extend a loan to a customer who has not opened an account with the bank. Loan applicants typically first have to apply for a bank account. The due diligence and credit checks that are always applied before a loan is extended are usually linked to the vetting procedures for opening a bank account. Even borrowers that wish to receive their loan in cash will normally first have to open a bank account, and will first receive the loan as a credit in their bank account.

Let us therefore consider the standard case that the borrower receives the loan as credit to the borrower's cheque account at the bank. We now revisit the scenario laid out by Paul Samuelson, receiver of the Swedish Central Bank Prize in Economic Sciences in Honour of Alfred Nobel: As shown in Table 10, Step 1, the receipt of the assumed cash deposit causes the accounting entries as shown by Samuelson. However, in Step 2, the bank customer receiving the loan causes a further increase in assets, as the loan contract is signed and acquired by the bank, and in liabilities, as the borrower's account is credited with the sum of the loan (instead of the cash payment shown by Samuelson).

[14] The test outcome is in line with the assessment by the Macmillan Committee (1931), which predicted what such a controlled experiment would yield:

> "If no additional in-payments were made by customers and there were no withdrawals in cash, the volume of deposits of a single banker would fluctuate only with the volume of the loans he himself made…" (p. 12).

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Table 10
Reconsidering Samuelson's description of the *Fractional Reserve Theory*.

Step 1: Receipt of new cash deposit of €202,000

Assets		Liabilities	
Cash reserves……	+€202,000	Deposits……	+€202,000
Loans and investments….	+€ 0		
Total……	+€202,000	Total……	+€202,000

Step 2: Extension of new loan of €200,000, but not in the form of cash

Assets		Liabilities	
Cash reserves……	+€ 0	Deposits……	+€200,000
Loans and investments….	+€200,000		
Total……	+€200,000	Total……	+€200,000

Total: Receipt of cash deposit, as shown by Samuelson, and extension of standard loan

Assets		Liabilities	
Cash reserves……	+€202,000	Deposits……	+€402,000
Loans and investments….	+€200,000		
Total……	+€402,000	Total……	+€402,000

As can be seen, the balance sheet lengthens further. It becomes apparent that the cash deposit of Step 1 is entirely irrelevant, and can be eliminated in an exposition of a bank's extension of loans. And then it becomes clear that Samuelson's example collapses to Step 2, which is identical with the *credit creation theory of banking*.

So by simply dropping the highly unrealistic assumption that loans are paid out in cash, we are back at the *credit creation theory*: the asset side expands by the amount of the loan (reflecting the loan contract) and so does the liability side, as the borrower's account is credited.

Samuelson based his exposition on a misleading and incorrect representation of bank procedures. In addition, his theory is inconsistent: while each bank is said to be just a financial intermediary, deposits with banks appear on the banks' balance sheet, although non-bank financial intermediaries, as discussed, do not own deposits by customers, and hence these cannot be shown on their balance sheet. Since however Samuelson shows the deposits on the bank's balance sheet, they cannot be a bailment or held in custody – off-balance sheet items – but are the property of the bank. This means that each bank is not a financial intermediary. Bank deposits, unlike deposits with non-banks, are merely a record of a loan to the bank. Thus a further inconsistency is that it is *a priori* not clear why customer deposits or reserves should be any constraint on bank lending as claimed by the *fractional reserve theory*: since deposits are a record of the bank's debt to customers, the bank is not restricted to lending only as much as its excess reserves or prior customer deposits allow. It can extend a loan and record further debts to customers, shown as newly created deposits (as the *credit creation theory* states).

So despite Samuelson's (1948) protestation that "A bank cannot eat its cake and have it too" (p. 325f), we see that in Table 10 (Total) the bank still has all its reserves and deposits at the moment it has granted the bank loan and credited the borrower's account. In other words, instead of being a necessary requirement as claimed by Samuelson's theory, the prior receipt of new funds is unnecessary in order for the bank to extend the loan. A careful examination of the relevant accounting and regulations involved should have made this clear to supporters of the *fractional reserve theory* and the many lecturers who over the past decades have been teaching economics using the Samuelson tract. The argument that the newly created deposit entry of the borrower will 'soon leave the bank' also does not change the results: in this case, in practice, the bank simply swaps a liability to the borrower (the newly created deposit) with a liability to a bank (the bank of the receiver of the payment made by the borrower from their newly created deposit) or the central bank (e.g. in case new central bank promissory notes, a.k.a. paper money or bank notes, are ordered). In either case, the balance sheet total remains unchanged, in its lengthened form.

Thus the accounting representations of both the *fractional reserve* and the *financial intermediation theories of banking*, whereby each bank is considered an intermediary, are deeply flawed: either each lender is a bank and hence able to create money due to the very fact that it does not have to hold client funds outside the firm, or the firm is a financial intermediary and not a bank, in which case the client funds do not appear on the firm's balance sheet at all.

For over a century no proponent of the fractional reserve or financial intermediation theories seems to have ever thought through the accounting implications – and contradictions – of these theories. We conclude that a greater emphasis on bank accounting and a more careful consideration of its implications should have raised serious doubts about the theoretical viability and consistency of both the *fractional reserve* and the *financial intermediation theories* much earlier, even without our conclusive empirical test.

Given the above analysis we can confidently say that the *fractional reserve theory of banking* in its textbook application, including the 'money multiplier' approach, is wrong. This may explain why it has been quietly dropped in textbooks over the past decade or so.[15] But the *financial intermediation theory of banking* is equally wrong, despite being supported by the many leading economists cited in the literature review above, who use it as the foundation of their work in this area, and for their policy recommendations.

4.3. Accounting for the steps after the loan has been spent

"*Bank credit creation does not matter, since banks will gradually lose the deposits.*" — This argument is often used to defend the *fractional reserve* or *financial intermediation* theories. However, banking operates within a closed accounting system: Deposits are bank liabilities and thus can only stay bank liabilities, on the balance sheet of a bank, even after transfer. They are a record of what Bank A owes, and the creditor (in this case, ironically, the borrower of the loan) can re-assign this debt of Bank A to some other bank. But of course it stays the debt of bank A (see Werner, 2014c). So deposits 'lost' can only go to other banks, and thus become an inter-bank liability. In other words, once a deposit has been created and transferred to another bank (Bank B), in this instance the first bank (Bank A) has received a loan from Bank B. If the receiver bank B is willing to 'accept' the transfer of the deposit, this is equivalent to the receiver Bank B giving credit to the first Bank A. So the balance sheet of the first Bank A only reflects a swap of a 'customer deposit' for a liability to another bank. Sorting out and netting such interbank liabilities is the original *raison d'être* of the interbank market. As long as banks create credit at the same rate as other banks, and as long as customers are similarly distributed, the mutual claims of banks on each other will be netted out and may well, on balance, cancel each other out. Then banks can increase credit creation without limit and without 'losing any money'. This has been recognised even by supporters of the *fractional reserve theory of banking*: Samuelson (1948) mentions – though fails to emphasise – that banks do not lose any reserves when they all create credit at the same pace and have equally dispersed customers. It is a mystery why Samuelson did not recognise this as approximating the standard case, and instead chose to highlight a hypothetical and highly unusual special case where a bank will pay out a

[15] Authors that had recognised the flaws in the fractional reserve theory include Charles Goodhart (1984): "The use of the money multiplier identity obscures, rather than illuminates…" (p. 199); Basil Moore (1988): "the notion of a money-multiplier identity is seriously deficient as an analytical concept" (p. 70); Richard Werner (2005): "…we conclude that the textbook representation of the actions of each bank is inaccurate" (p. 176).

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loan in cash to someone who does not hold an account at the bank.[16] It is even more mysterious why later editions of this most influential textbook dropped out this section on the netting of interbank liabilities and consequent money creation by the banking system without direct restraint from reserves.

5. Implications for bank regulation

The implications of our empirical findings are far-reaching for bank regulation and the design of official policies. Bank regulation is based on the prevailing understanding of the role of banks. During the past forty years when the *financial intermediation theory of banking* has been dominant, bank regulation has focused on capital adequacy. During the earlier thirty years or so, when the *fractional reserve theory of banking* was dominant, reserve requirements featured as the main way to regulate bank activity. Neither has been successful.

5.1. Regulation via reserve requirements

Bank regulation centred on reserve requirements was based on, and theoretically supported by, the *fractional reserve theory of banking*. It was found, however, that this regulatory policy was impracticable for central banks to operate (Goodhart, 1989). In this paper we have identified just why this had to be the case: the *fractional reserve theory of banking* is wrong. An analysis of bank accounting shows that banks' reserves with the central bank never leave the accounts of the central bank: like 'deposits' of the public with banks (which in reality are simply records of units of accounting money owed by banks to the public), 'reserves' by banks at the central bank are simply accounting records of money units owed by the central bank to the banks. Such indebtedness does not directly result in money circulating in the economy, except when it is due to a demand for legal tender cash (Ryan-Collins et al., 2011). To make central bank expansionary monetary policies more effective, it would thus be sensible to expand the role of cash — although, surprisingly, today central bankers are calling for its abolition (Haldane, 2015). As reserve requirements were not an effective policy tool, they have gradually been de-emphasised. Some central banks, such as the Bank of England and the Swedish Riksbank, have abolished reserve requirements altogether.

5.2. Regulation via capital adequacy

In parallel with the policy to de-emphasise reserve requirements in bank regulation, central banks, via their influence on the Basel Committee on Banking Supervision, have shifted towards regulating banks using capital ratios. This approach is predicated on the veracity of the *financial intermediation theory*, which had been increasingly supported by central banks. As financial intermediaries, banks cannot, individually or in aggregate, increase the money supply available as potential bank capital. Hence imposing capital requirements on banks appears to be a viable way to keep their actions within limits. The contradiction is that, if banks were only financial intermediaries, their actions could hardly have a significant macroeconomic impact in any case, rendering such regulation unnecessary. It seems, once again fundamental facts concerning banking have been overlooked.

In reality the money supply is "created by banks as a byproduct of often irresponsible lending", as journalist Martin Wolf called it (Wolf, 2013). Thus the ability of capital adequacy ratios to rein in expansive bank credit behaviour is limited: imposing higher capital requirements on banks will not necessarily stop a boom-bust cycle and prevent the subsequent banking crisis, since even with higher capital requirements, banks could still continue to expand the money supply, thereby fuelling asset prices: Some of this newly created money can be used to increase bank capital (Werner, 2010). This was demonstrated during the 2008 financial crisis.

5.2.1. How to create your own capital: the Credit Suisse case study

The link between bank credit creation and bank capital was most graphically illustrated by the actions of the Swiss bank Credit Suisse in 2008. This incident has produced a case study that demonstrates how banks as money creators can effectively conjure any level of capital, whether directly or indirectly, therefore rendering bank regulation based on capital adequacy irrelevant: Unwilling to accept public money to shore up its failing capital, as several other major UK and Swiss banks had done, Credit Suisse arranged in October 2008 for Gulf investors (mainly from Qatar) to purchase in total over £7 billion worth of its newly issued preference shares, thus raising the amount of its capital and thereby avoiding bankruptcy. A similar share issue transaction by Barclays Bank was "a remarkable story of one of the most important transactions of the financial crisis, which helped Barclays avoid the need for a bailout from the UK government". The details remain "shrouded in mystery and intrigue" (Jeffrey, 2014) in the case of Barclays, but the following facts seem undisputed and disclosed in the case of Credit Suisse, as cited in the press (see e.g. Binham et al., 2013):

The Gulf investors did not need to take the trouble of making liquid assets available for this investment, as Credit Suisse generously offered to lend the money to the Gulf investors. The bank managed to raise its capital through these preference shares. Table 11 illustrates this capital bootstrapping (not considering fees and interest).

Table 11
How to create your own capital: Credit Suisse in 2008.
£bn.

Step 1: Loan to Gulf Investor

Assets			Liabilities		
			Deposits	+	7
Loans and investments	+	7	Capital	+	0
Total	+	7	Total	+	7

Step 2: Capital Raising: A Liability Swap

Assets			Liabilities		
			Deposits	+	0
Loans and investments	+	7	Capital	+	7
Total	+	7	Total	+	7

Since it is now an established fact that banks newly invent the money that is 'loaned' by creating it out of nothing, the loan to the Gulf investor created (in step 1) a simultaneous asset and liability on the bank's balance sheet, whereby the customer's borrowed money appears as the fictitious customer deposit on the liability side, of £7bn. Considering the same change in step 2, but now after the liability swap, we see that the newly issued preference shares boost equity capital: They are paid for with this fictitious customer deposit, simply by swapping the £7bn from item 'customer deposit' to item 'capital'. Credit Suisse is then able to report a significant rise in its equity capital, and hence in its capital/asset ratio. Where did the additional £7bn in capital come from? Credit Suisse had lent it to the investor, using its own preference shares as collateral, and hence had invented its own capital. The risk to the borrower was also limited if the Credit Suisse shares, not other assets, served as collateral.

As has been pointed out (Werner 2014c), in the UK such actions would be illegal, as they violate Section 678 of the Companies Act

[16] In the words of Moore (1988):

"While an individual bank will gradually lose the primary deposits created by its loan, provided that it just keep pace with the rate of loan expansion of its competitors it will gain secondary deposits from the recipients of their borrowers, so that no net outflow of funds at clearing need result" (p. 68).

2006 (Prohibition of assistance for acquisition of shares in public company). However, the Swiss regulators were happy to tolerate this. The transgression is clearly graver in the case of a bank, compared to an ordinary firm lending to an investor to purchase the firm's shares: Credit Suisse had not merely lent a prospective shareholder the funds to buy its shares, but it created the funds out of nothing. A very similar transaction involving similar amounts and also Qatar as investor is alleged to have been undertaken by Barclays Bank in the UK, allegedly also involving an upfront 'fee' paid to Qatar of £322m, which could be a refund of the interest on the loan. The role of interest is a topic not discussed in detail in this article. In such a transaction, Barclays would likely need to charge interest on the loan, in order for it to appear as a regular deal. If the Gulf investor was acting as a strawman for what amounts to an internal accounting exercise to create the bank's own capital out of thin air, a part or all of this fee could have been the refund of the interest on the loan, so that the investor would not even have to pay interest for receiving the newly created money and with it the preference shares.

According to analysts at Italian bank Mediobanca, such bank loans to new bank share investors were a "fairly common practice... during the crisis", whereby Credit Suisse may have been unusual in disclosing this and obtaining regulatory approval. Either way, banks in this way created their own capital out of nothing, thus making nonsense of capital adequacy regulations.

We learn from this that under the right circumstances it is possible even for an individual bank to show almost any amount of capital to regulators. It is even more easily possible for the whole banking system collectively to do likewise, without directly contravening the Companies Act. Since during boom times an increasing amount of money is created by banks (hence the boom), some of that can be siphoned off by banks to bolster their capital by issuing new equity. The regulators seem unaware of this fact, as their descriptions of banking reveal them to be adherents of the erroneous *financial intermediation theory of banking*.

5.3. Empirically successful bank regulation

Having briefly discussed historically unsuccessful bank regulation, it remains to be stated that there is a form of bank regulation that has been empirically successful. Not surprisingly, this form of bank regulation was based on a recognition of the veracity of the *credit creation theory of banking*: Many central banks have successfully avoided banking crises for several decades by imposing regulations on banks concerning the quantity and allocation of bank credit. Known as 'credit guidance' or 'window guidance', such policies have also been at the heart of the high growth in the successful East Asian economies such as Japan, Korea, Taiwan and China (Werner, 2002, 2003, 2005). Using such guidance, bank credit for non-GDP (i.e. asset) transactions could be suppressed, so that asset bubbles and subsequent banking crises were avoided. When instead bank credit was guided towards productive use, high, stable and non-inflationary economic growth could be achieved, as the Quantity Theory of Credit (Werner, 1997, 2005) suggests. An alternative approach to avoiding asset bubbles and banking crises and stimulating high and stable growth has been demonstrated in Germany, where the structure of the banking sector – consisting largely of many small not-for-profit banks – produced this result.

6. Implications for development policies

The findings also have broader implications for policies to ensure economic growth and minimise unemployment, as well as policies for developing countries concerning the question of how to maximise sustainable growth.

As was noted above, the Keynesian growth models by Harrod (1939) and Domar (1947), following the *financial intermediation theory of banking*, argue that savings are necessary for investment and hence economic growth. These theories have, together with more recent theories, been deployed by the IMF and the World Bank in their policy advice to developing countries to obtain the allegedly 'necessary' savings for investment and economic growth from foreign lenders, and to substitute for their lacking 'domestic savings'. The international banks usually came on the heels of the Washington institutions and, whenever a developing country had resources or attractive assets, were keen to lend.

As a result, a large number of developing countries, as well as transition economies and emerging markets have accumulated large amounts of foreign debt. This debt was invariably denominated in foreign currency and needs to be serviced at interest. This suggests that the sophisticated international banks felt that the developing countries are far better at hedging currency risk than they are.

This was not the case: since most of the indebted countries are commodity exporters, in the long-run (over a century or so) their terms of trade tend to fall (as the relative price of their exports declines over time compared to the relative price of their imports — since relative prices are a function of value added, with high value added exports over time becoming more expensive in relative terms and low value added exports becoming cheaper, see Prebisch, 1950, and Singer, 1950). Thus over time their currencies can be expected to decline, compared to the US dollar or European currencies. Therefore the advice to borrow in foreign currency was not in the interest of the borrowers. In domestic currency terms their foreign debt and payments to service them hence rose over time. Meanwhile, fixed exchange rate systems are not likely to remain sustainable, if there is substantial foreign borrowing, as the Asian crisis has shown.

The large and rising amounts of payments to service their foreign debt may explain what otherwise is a puzzle in economic theory, namely why international financial flows seem to be directed from poor countries to rich countries (theory predicts the opposite, due to the yield differential, see Lucas, 1990). As a result, a transfer of net resources from the less well-off countries to the rich countries has been taking place, putting the former ever more at the mercy of the latter. (As long as this process continues the residents of the less well-off countries have an incentive to vote with their feet, and migrate to the richer countries, if they are allowed to).

This article and Werner (2000, 2014b) have demonstrated that the justification for this approach to economic development is flawed. Worse, when considering the bank accounting reality of such international borrowing it emerges that it has been one cruel trick on developing countries: In many, if not most cases, the countries would have been better off by not borrowing from abroad at all. The foreign money never entered their economies: the accounting reality of international banking shows that US dollars stay in the US banking system, and euros stay in the European banking system. Bank money stays within the respective banking system of the currency of denomination. (This is also true for foreign currency accounts or mortgages offered by banks: in these cases, respective balances are recorded in accounts with overseas correspondent banks.) In other words, the dollars that created the 'Third World Debt' problem never even entered the borrowing countries. If and when such foreign currencies are exchanged by developing countries into domestic currency, they will merely result in an increase in credit creation by the domestic banking system, denominated in domestic currency. However, this is something any developing country can arrange for without the need to borrow from abroad at all (Werner, 2000, 2003a).

So the advice to borrow from abroad was largely against the interests of the developing countries: it exposed these countries to foreign currency risk, often resulting in mounting debt and interest outflows in excess of any loans received. But it triggered such 'solutions' to the problem as debt for equity swaps, handing over national assets to the foreign lenders. Bankers suggesting debt relief, such as Alfred Herrhausen, head of Deutsche Bank, were unpopular with their colleagues. To add insult to injury, it is now established that the foreign loans were not necessary for domestic growth, after all: the foreign

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lenders merely created the money out of nothing through bank credit creation, something the borrowers could have done themselves at home without the foreign loans.

The alternative to this Washington Consensus approach to 'aiding' developing countries has been showcased in East Asia. The highly successful economies of Japan, Taiwan, Korea and China all used mechanisms to guide domestic bank credit to productive use, funding import substituting domestic and exporting industries, as discussed above in section 5.3. The findings in this paper provide fundamental support for this argument.

The findings are of equal relevance for developed economies. Countries such as Japan, Spain or Greece have been experiencing low nominal GDP growth. Applying the knowledge of bank credit creation to fiscal policy, an important lesson is that the method of funding government expenditure can have a significant impact on the effectiveness of fiscal policy. As Werner (2014a) shows, governments can enhance the degree of stimulation achieved by any given fiscal policy, if the source of government funding is changed from bond issuance to borrowing from banks. The latter expands the money supply and results in growth of nominal GDP and tax revenues.

7. Implications for economics

How is it possible that for the largest part of the past century erroneous and misleading theories have dominated the economics discipline? This is a topic for future research, and only two avenues will be briefly explored here: the role of research methodology, and the role of interested parties.

7.1. Methodology in economics

Classical and neo-classical economics, as dominant today, has used the deductive methodology: Untested axioms and unrealistic assumptions are the basis for the formulation of theoretical dream worlds that are used to present particular 'results'. As discussed in Werner (2005), this methodology is particularly suited to deriving and justifying preconceived ideas and conclusions, through a process of working backwards from the desired 'conclusions', to establish the kind of model that can deliver them, and then formulating the kind of framework that could justify this model by choosing suitable assumptions and 'axioms'. In other words, the deductive methodology is uniquely suited for manipulation by being based on axioms and assumptions that can be picked at will in order to obtain pre-determined desired outcomes and justify favoured policy recommendations. It can be said that the deductive methodology is useful for producing arguments that may give a scientific appearance, but are merely presenting a pre-determined opinion.

Werner (2005) argues that research in economics and finance should instead be based on a rigorous application of the scientific inductive methodology. This will ensure that empirically-based and scientific research is produced, which is far less prone to be influenced by prior political views of the authors than is the case with research based on the deductive methodology. Needless to mention, it is the inductive methodology that has led to the research presented in this paper.

7.2. Information management

Progress in economics and finance research would require researchers to build on the correct insights derived by economists at least since the 19th century (such as Macleod, 1856). The overview of the literature on how banks function, in this paper and in Werner (2014b), has revealed that economics and finance as research disciplines have on this topic failed to progress in the 20th century. The movement from the accurate *credit creation theory* to the misleading, inconsistent and incorrect *fractional reserve theory* to today's dominant, yet wholly implausible and blatantly wrong *financial intermediation theory* indicates that economists and finance researchers have not progressed, but instead regressed throughout the past century. That was already Schumpeter's (1954) assessment, and things have since further moved away from the *credit creation theory*.

The analysis of the fractional reserve and financial intermediation theories in this paper and in Werner (2014b) provides indications that attempts were made to obfuscate, as if authors were at times wilfully trying to confuse their audience and lead them away from the important insight that each individual bank creates new money when it extends credit. An examination of his 1948 textbook suggests that Samuelson was more aware of the power of individual banks to create money than later authors, but he chose to distract from this fact with unrealistic special cases. But also Keynes did much to regress the discipline, with his followers Tobin and others spearheading the promulgation of the *financial intermediation theory of banking*, so that even the *fractional reserve theory* disappeared from sight, and banks became mere financial intermediaries also in aggregate. Many economists appear to have been aware of the fact that banks create money out of nothing, but chose to de-emphasise it, or even produce analysis that contradicts it. Joseph Stiglitz, whose textbook emphasises the fractional reserve theory, in 2003 conceded - only briefly and almost hidden at the very end of his co-authored book- that

> "When a bank extends a loan, it creates a deposit account, increasing the supply of money. … the creation of money and the creation of credit occur together"
>
> (Stiglitz and Greenwald, 2003, p. 295).

Yet, this insight was not visibly applied in their book. Moreover, on the same page the authors appear to erroneously believe that this ability to create money is not unique to banks:

> "Attempts to restrict banks may simply divert more of the credit creation activities to non-bank sources of credit"
>
> (op. cit., p. 295).

That such important insights as bank credit creation could be made to disappear from the agenda and even knowledge of the majority of economists over the course of a century delivers a devastating verdict on the state of economics and finance today. As a result, the public understanding of money has deteriorated as well. Today, the vast majority of the public is not aware that the money supply is created by banks, that banks do not lend money, and that each bank creates new money when it extends a loan.

The question whether the sequential introduction of the incorrect fractional reserve and financial intermediation theories of banking – leading the student ever further away from the truth – was intentional or not requires further research. Such research should focus on the role of interested parties, especially that of internationally active banks, central banks and privately funded think tanks, in influencing academic discourse. It is worrying, for instance, that the topic of bank credit creation has been a virtual taboo for the thousands of researchers of the world's central banks during the past half century. As Cheng and Werner (2015) show, among the 3882 research papers produced and made available online by five major central banking research outlets (Federal Reserve Board Washington, Federal Reserve Bank of New York, Bank of Japan, European Central Bank, Bank of England) in the two decades to 2008, only 19 articles even included the words 'credit creation'. Of these, only 3 seemed to use the term in the correct sense of bank creation of credit and money. On the other hand, experienced central bankers aware of the importance of bank credit creation have spoken out about this topic after leaving the central bank (Kure, 1975; Werner, 2003a). Why have central banks – where the largest number of experts on this topic could be expected to work – singularly failed to even research this topic, let alone formulate and crystallise useful policy recommendations from it? A former central banker in a rare frank interview discusses this issue (Werner, 2003b, Ishii and Werner, 2003) and suggests that central banks have been engaging in 'information management', by purposely

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controlling and shaping the research they publish. Senior staff approve the research topics and check, modify and censor articles written by the central bank researchers before delivering them to the public. In this process, what is considered a 'harmful truth' gets weeded out, while what is considered useful for the central bank remains. In other words, the publications of central banks must be considered biased. Considering these facts, one is left to wonder whether the actual goals of central banks are the right ones, and whether the research they publish is useful.

It is also a relevant subject of future research to investigate how central banks have exerted influence over the research conducted by academics. For instance, the Swedish central bank established a pseudo-'Nobel Prize' by awarding substantial sums of money to selected economists – none of them supporters of the credit creation theory of banking – and calling this prize the 'Riksbank [Swedish central bank] prize in economic sciences in honour of Alfred Nobel'. The fact that journalists would abbreviate this as a 'Nobel Prize' in their reporting of the award could neither have been a surprise nor unwelcome to the Swedish central bank, which lobbied for the involvement of the Nobel Foundation in the award of this prize. Through the award of this central bank prize, a particular branch of economics, usually based on the deductive methodology, received a significant boost internationally. It is noticeable that a number of authors implicated in leading the public away from the credit creation reality of banking have been receivers of this Swedish central bank prize (including Samuelson, Tobin and Krugman).

Meanwhile, investigative journalists have pointed out that the editorial boards of leading journals in economics and especially monetary economics are staffed by current or former employees of and consultants to central banks, particularly the US central bank.[17]

More research on the 'information management' policies of central banks, think tanks and even universities is called for.

8. Conclusion

In this paper the reason why bank regulation based on the *fractional reserve* and on the *financial intermediation theories of banking* have not been successful could be identified. On the other hand, having no bank regulation is also not likely to be successful, as the 2008 financial crisis has shown: Bank credit derivatives had been entirely unregulated on the advice of Alan Greenspan and other supporters of unregulated markets. They have since concurred with their critics that regulation would have been better. But what type of bank regulation is likely to be more successful?

In the era when the *credit creation theory of banking* was dominant, its proponents pointed out that bank credit creation and growth in economic activity are connected, and credit for different types of transactions has a diverging effect on the economy. They have thus favoured bank regulation that directly targets bank credit, both its quantity and its quality (i.e. the type of transaction that gets funded by bank credit), whereby economically desirable bank credit is encouraged, and economically harmful credit creation is forbidden or restricted quantitatively. The relationship between disaggregated bank credit creation on the one hand and nominal GDP growth, real GDP growth and asset prices on the other was identified by the Quantity Theory of Credit (Werner, 1992, 1997, 2005, 2012, 2013), which can serve to guide the direction of credit. In particular, guidance could be used to restrict credit for transactions that do not contribute to nominal GDP: such credit for financial transactions creates asset boom-bust cycles and instability in the banking system. Before the use of reserve requirements, capital adequacy or interest rate targeting became dominant in the second half of the 20th century, central banks focused more on controlling bank credit directly. This policy was pioneered by the Reichsbank in 1912, but has been tried and tested by most central banks sometime between the 1920s through to the 1960s (with some continuing the practise until the 1980s, such as the Bank of Japan and the Banque de France with their 'window guidance' and *encadrement du credit* techniques, respectively). Credit guidance has an excellent track record in achieving the targeted credit growth and sectoral allocation (Werner, 2005). This is especially relevant in the era of post-crisis monetary policy (see Lyonnet and Werner, 2012, Werner, 2013).

The fact that banks create credit and money out of nothing which, if used productively, results in non-inflationary growth, is important for developing countries. Often it will not make sense to borrow from abroad in order to stimulate domestic growth: the foreign money does not enter the economy, and the country gets ensnared in spiralling foreign currency debt, when actually the foreign banks just created the money out of nothing, something the developing country could have arranged for through its own domestic banks. It also has implications for the question of who should pay for bank bailouts, shifting the pendulum from burdening tax-payers towards central bankers (Werner, 2012).

The question why economics seems to have made no progress in the 20th century concerning a pivotal issue, namely the role of banks, is important and troubling. The thesis that conflicts of interest and indeed vested interests may have been at play (especially emanating from central banks and large banks) was discussed and requires further research.

Overall it can be said that one of the implications of this study is that it does not make much sense to build economic theories of the financial sector, if these are not based on institutional (and accounting) realities. The role of accounting and law in economics should be increased, both in research and in the teaching of economics. This includes the role of national income accounting and flow of funds information (see Winkler et al., 2013a, b), which have to be reconciled with those records of the banks. These are not only the "central settlement bureau, a kind of clearing house or bookkeeping centre for the economic system" (Schumpeter, 1934, p. 124), but also the creators and allocators of the money supply. The reflection of empirical bank reality within theories and textbooks surely must become the 'new normal' in finance and economics.

Finally, the confirmation of the results reported in Werner (2014b) further strengthens the call for a new, interdisciplinary research agenda on the role of banks and the central bank in particular, and the monetary system in general, which should be firmly rooted in the inductive, empirical research methodology to produce scientific economics. While many authors have proclaimed a continuous blurring of the division between banks and non-bank financial institutions, Werner (2014c) showed precisely what allows banks to create money (and capital) out of nothing, while non-banks are unable to do so. Interdisciplinary work with researchers in politics, law, accounting, management, operational research, information technology, engineering and systems research is called for to ensure that economics and finance on their own cannot continue to ignore empirical reality and embark on another lost century for economic sciences.

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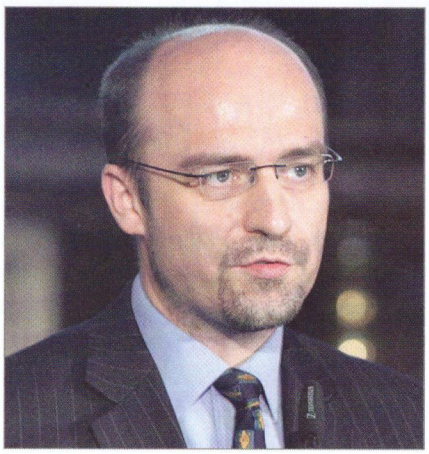
Aufgedeckt: Banken erzeugen mit Krediten Geld aus Luft

Der Finanz-Professor Richard Werner hat erstmals empirisch nachgewiesen, was Forschung und Lehre bisher geleugnet haben: 97 Prozent der weltweiten Geldmenge ist gleichbedeutend mit Krediten. Die Bank von England bestätigt und wirft damit Fragen auf.

Wolfgang Freisleben

Der 7. August 2013 wird zweifellos in die (Wirtschafts-) Geschichte eingehen. Als jener Tag, an dem erstmals seit über 100 Jahren nicht nur über Geld theoretisiert, sondern auch der empirische Beweis erbracht wurde, wie Geld abseits der Notenbanken wirklich entsteht. Von diesen wird nämlich nur Bargeld als weltweit gesetzliches Zahlungsmittel in den jeweiligen Ländern geschaffen. Oder gegen Wertpapiere im Zuge der Offenmarktgeschäfte getauscht. Oder durch den Ankauf von Gold.



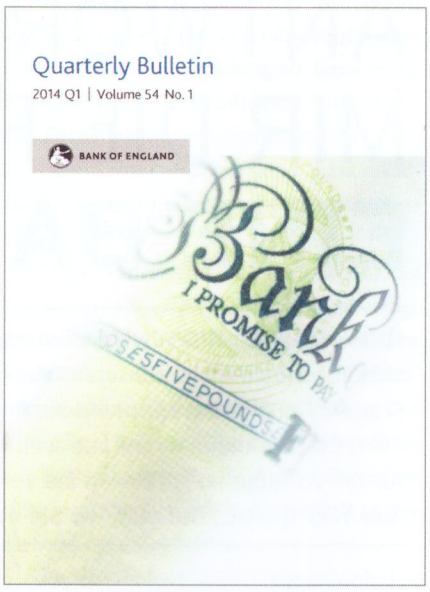
Finanzwissenschafter Richard Werner: Kreditschöpfungstheorie ist Realität

Die privaten Geschäftsbanken hingegen erzeugen tagtäglich Geld durch die Kreditvergabe. Einfach so. Aus Luft. Sie sind also nicht Geldvermittler, sondern Geldproduzenten. Geld ist also gleichbedeutend mit Kredit. Dieses Buch- oder Giralgeld wird auch „Fiat"-Geld genannt (fiat lateinisch = „es werde", abgewandelt aus dem göttlichen Spruch „fiat lux" – es werde Licht). Es entsteht übrigens unabhängig von Mindestreserve oder sonstiger theoretischer Wischiwaschi-Erklärungen zahlloser sogenannter Wissenschafter und Experten, die Theorien gelehrt haben und immer noch lehren, die nie wirklich bewiesen wurden. Daran liegt es auch, dass unser Finanzsystem als mystisch und für den „normal Sterblichen" kaum erklärbar eingeschätzt wird.

Klarheit schuf 2013 erstmals der deutsche Universitätsprofessor Richard Werner, als er an besagtem Augusttag bei der Raiffeisenbank in dem kleinen Städtchen Wildenberg (knapp 1.350 Einwohner) im niederbayerischen Landkreis Kelheim auftauchte, um einen Kredit aufzunehmen. Das wäre an sich nicht bemerkenswert, hätte der an der britischen Universität Southampton lehrende Finanzwissenschafter nicht ein Kamerateam der Londoner öffentlich-rechtlichen Rundfunk- und TV-Anstalt BBC im Schlepptau gehabt, das den Geschäftsablauf dokumentieren sollte. Dahinter stand eine spektakuläre Absicht: die Enttarnung des westlichen Geldsystems. Nicht mehr. Und nicht weniger.

QUARTALSBERICHT DER BANK VON ENGLAND BLIEB UNBEACHTET

In Konsequenz der empirischen Erhebungen des Universitäts-Professors und der unanfechtbaren BBC-Dokumentation lüftete die Bank von England (BoE) im März 2014 in einem Quartalsbericht (Quarterly Bulletin 2014/Q1) erstmals das Jahrhunderte lang sorgsam gehütete Geheimnis und bestätigte hochoffiziell, dass die Geschäftsbanken mit der Kreditvergabe unmittelbar und exzessiv Geld aus dem Nichts schaffen. Daraus resultieren laut BoE rund 97 Prozent der weltweiten Geldmenge. Nur der minimale Rest geht auf das Konto der Zentralbanken. Das Eingeständnis verursachte allerdings vorerst außerhalb der britischen Zentralbank nur wenig Echo. Denn Quartalsberichte von Zentralbanken werden vor allem als statistische Quellen herangezogen. Grundlegende neue Erkenntnisse erwartet sich üblicherweise kaum jemand. Dement-



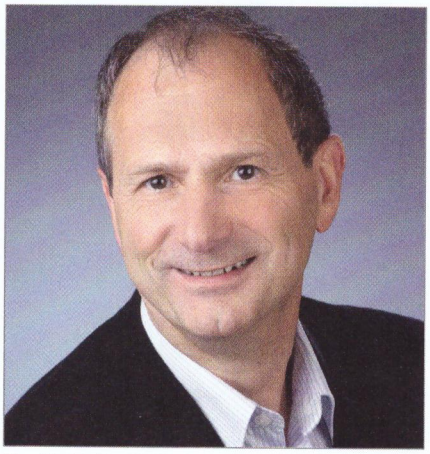
Quartalsbericht der Bank von England: Brisante Enthüllung über das Geldsystem

sprechend blieb die Offenbarung der breiten Öffentlichkeit bis heute vorenthalten. Außerdem hat die Finanzwelt aus verständlichen Gründen kein Interesse an der Offenlegung der Kredit-Geld-Zauberei.

Richard Werner legte dann am 16. Dezember 2014 mit der Veröffentlichung seiner Studie mit dem Titel „Can banks individually create money out of nothing? — The theories and the empirical evidence" im „International Review of Financial Analysis" nach. Damit unterlegte er die seit Jahrzehnten denunzierte „Kreditschöpfungstheorie". Auch diesmal blieb das Echo in Forschung, Lehre, Politik und Medien aus. Nur hinter den Kulissen wird gegrübelt. Denn seit dem Ende der 1960er-Jahre galt die „Finanzintermediär-Theorie" als gängige Lehrmeinung. Sie behauptet, dass die Banken reine Finanzintermediäre seien, die Einlagen sammeln und als Kredite gegen Zinsen weitergeben. Die Theorie dient auch der Rechtfertigung, warum die Kreditzinsen immer deutlich höher sein müssen als die Einlagenzinsen. Das ist jetzt als Schwindel enttarnt.

Vor dieser aktuellen wissenschaftlichen Modeerscheinung hatte zwischen den 1930er- und späten 1960er-Jahren das „Teilreserve- oder Multiplikatormodell" die Lehre dominiert. Dieses beschreibt, dass die Banken im Gegensatz zu Finanzintermediären im Kollektiv Geld schaffen würden. Trotz dieser Fähigkeit zur Geldschöpfung sei aber jede einzelne Bank nach dieser Sichtweise nur ein reiner Finanzvermittler, der Einlagen sammelt und weiter verleiht – ohne die Fähigkeit, selbst Geld zu schöpfen.

BBC London: Im Archiv die Bild- und Filmdokumentation der Geldschöpfung



Kreditchef Ludwig Keil: Augenzeuge einer historischen Offenbarung

RAIFFEISENBANK IM BAYERISCHEN WILDENBERG ÖFFNET DAS TOR

Professor Richard Werner war allen Theorien nachgegangen, ehe er in den Geschäftsräumen der bayerischen Bank einen Kreditvertrag unterzeichnete und auf seinem neuen Konto 200.000 Euro gutgeschrieben wurden. Als Leiter (und einziger Mitarbeiter) der Kreditabteilung war Ludwig Keil in die Transaktionen involviert, die einschließlich seiner manuellen Eingaben von dem BBC-Reporter Alistair Fee und seinem Kameramann gefilmt wurden. Die Bildschirme des bankinternen IT-Terminals wurden bei jedem Durchführungsschritt fotografiert. Die beiden (einzigen) Bankdirektoren wachten als unbeteiligte Zuschauer über die Offenlegung des internen Standardablaufs ihres Kreditvergabeverfahrens: Am Anfang bei der Kundendokumentation, beim Unterzeichnen des Kreditvertrages und der Buchung des Kreditbetrages auf dem Konto des Kreditnehmers. Durch Überwachung der internen Aufzeichnungen ließ sich bestätigen, dass im Prozess der Kreditvergabe von anderen Konten innerhalb oder außerhalb der Bank keinerlei Mittel transferiert oder neu erschaffen wurden. Auf die Einhebung von Zinsen verzichtete die Bank zur Unterstützung des wissenschaftlichen Forschungsprojekts.

Als Ergebnis der simplen Finanztransaktion in Wildenberg war klar zu erkennen, wie sich die Kreditvergabe in den Büchern einer Bank niederschlägt. Bis dahin galt noch als eher versponnene Idee, dass Banken womöglich „Geld aus dem Nichts" schaffen könnten. Doch nun führte Richard Werner den weltweit ersten empirischen Beweis in der Geschichte des Geldes, dass Banken durch ihre tägliche Praxis dieser Theorie – der sogenannten „Kreditschöpfungstheorie" – auch tatsächlich entsprechen. Sie war in den ersten Jahrzehnten des 20. Jahrhunderts aufgekommen und behauptete schlichtweg, dass Geschäftsbanken – und nicht nur die Zentralbanken – bei jedem Kreditvorgang im eigenen Haus Geld „aus dem Nichts" schöpfen – oder auch: aus Luft erzeugen.

Zur Sicherung der Erkenntnisse drehte die BBC danach noch zwei weitere Mini-Dokumentarfilme mit Professor Werner bei empirischen Nachweisen zur Geldtheorie in der VR-Bank Landau und der Sparkasse Niederbayern-Mitte.

DURCH KREDITVERGABE ENTSTEHT BEIM KUNDEN EINE BANKEINLAGE

Wie Werner in der Studie analysiert, schafft die Bank mit der Kreditvergabe gleichzeitig eine imaginäre Einlage (im Finanzjargon sinnigerweise als „Sichteinlage" ▸

bezeichnet, die erst entsteht, wenn man sie sieht) auf dem Kontokorrentkonto des Kreditnehmers, obwohl real keine Geldeinlage stattgefunden hat. Gleichzeitig wird auf dem Darlehenskonto des Kunden der gleiche Betrag – mit einem Minus vorangestellt – als Schuld ausgewiesen (siehe Tabelle „Finanzübersicht").

Es handelt sich also tatsächlich um eine „Kreditgeldschöpfung aus dem Nichts". Die Bilanz der Bank verlängert sich. Bargeld, Zentralbankreserven oder Guthaben bei anderen Banken sind unmittelbar nicht notwendig, da Reserven und Eigenkapitalanforderungen nur über bestimmte Beobachtungszeiträume eingehalten werden müssen.

DER EMPIRISCHE BEWEIS STÜTZT DIE KREDITSCHÖPFUNGSTHEORIE

In der Tagesbilanz der Bank zeigt sich vom Ende des 6. August 2013 bis zum Ende des 7. August 2013, nachdem die Transaktion für die empirische Untersuchung durchgeführt worden ist, auf der Aktivseite unter dem Abschnitt „Forderungen an Kunden" in der Zeile „mit Laufzeit bis unter 4 Jahre" eine Zunahme um 200.000 Euro. Auf der Passivseite der Bankbilanz wurde gleichzeitig eine Gutschrift für den Kunden unter der Position „Verbindlichkeiten gegenüber Kunden" in der Zeile „täglich fällig" mit ebenfalls 200.000 Euro verbucht.

Aus dieser Buchung ist zu ersehen, dass die Bank die – ohne Geldzuführung – künstlich buchhalterisch geschaffene Kundeneinlage wie einen Kredit an die Bank behandelt. Sie vergibt also buchhalterisch als Forderung einen Kredit und schafft sich damit gleichzeitig selber eine Verbindlichkeit in Höhe desselben Betrags. Beides gegenüber ein- und demselben Kunden.

Die Kunden wiederum erhalten von der Bank die Buchung ihrer Kredite unter der Bezeichnung „Einlage" auf ihrem Kontoauszug – als Forderung gegenüber der Bank. Denn die hat sich ja zur Zahlung verpflichtet (obwohl sie das Geld physisch ja gar nicht zur Verfügung hat). Dies kann jedenfalls nicht mit der gängigen „Finanzintermediär-Theorie" in Einklang gebracht werden.

Die „Teilreserve-Theorie" wiederum scheidet deshalb aus, weil der Anstieg der Gesamtverbindlichkeiten der Bank am 6. August 2013 ausschließlich durch die Zunahme jener Verbindlichkeit von 200.000 Euro verursacht wurde, die aus der gleich hohen Guthabens-Buchung auf dem Kontokorrentkonto des Kunden resultierte. Daher kann die gesamte Zunahme der Verbindlichkeiten ihre Ursache nicht in einem zufälligen Anstieg der Kundeneinlagen am Tag der Kreditvergabe haben, weil es die nicht gab. Die Passivseite der Bilanz scheint daher nur mit der „Kreditschöpfungstheorie" im vollkommenen Einklang zu stehen.

Fest steht überdies: Wenn man die anderen damals stattgefundenen Transaktionen in der Bank ausklammert, hätte sich die Bilanz der Bank um den gleichen Betrag verlängert, mit dem der gegenständliche Kredit vergeben wurde. Diese Feststellung stimmt gleichfalls nur mit der „Kreditschöpfungstheorie" überein.

FÜR DEN KREDIT WURDE KEIN GELD VON ANDEREN KONTEN GENOMMEN

Die Untersuchung der tatsächlichen internen Bankbuchhaltung „in einer unkontrollierten realen Umgebung" hat außerdem ergeben, dass die Bank in dem Kreditvergabe-Prozess das Geld nicht von anderen internen oder externen Konten abgebucht hat. Auch damit muss sowohl die Teilreserve- als auch die Finanzintermediär-Theorie verworfen werden. Stattdessen konnte festgestellt werden, dass die Bank diese Mittel neu „erfunden" hat, indem sie diese – natürlich irreführend und nicht ganz korrekt – als Einlage (Sichteinlage) auf dem Konto des Kreditnehmers gebucht hat, obwohl eine solche Einlage physisch gar nicht stattgefunden hat. Dies steht im Einklang mit Annahmen der „Kreditschöpfungstheorie".

Damit kann jetzt – erstmals in den 5.000 Jahren der Geschichte des Geld- und Bankwesens – mit Zuversicht gesagt werden, dass es empirisch nachgewiesen ist, dass jede einzelne Bank Geld aus dem Nichts schafft, wenn sie das vergibt, was man „Bankkredit" nennt. Einfach so – aus Luft.

Henry Ford, der Gründer der US-amerikanischen Ford Motor Company, hatte 1946 dafür seine eigene Erklärung: „Eigentlich ist es gut, dass die Menschen der Nation unser Banken- und Geldsystem nicht verstehen. Würden sie es nämlich, so hätten wir eine Revolution noch vor morgen früh." Denn wer versteht schon, dass er das „aus Luft" fabrizierte Kreditgeld zurückzahlen muss, obwohl es zuvor gar nicht existiert hat, und überdies noch Zinsen für das „Luftgeld" draufzulegen hat? Ärger ist jedenfalls angebracht. Denn über 200 Jahre haben uns die Drahtzieher der geheimen Geldmaschine- ▸

Finanzübersicht Personennummer: 4463600

Einzelaufstellung Konten/Depot

Kontokorrent

Kontonummer	Produktbezeichnung	Währung	Kontostand	Zinssatz
44636	KK- Konto ohne Gebühren	EUR	200.000,00	0,00000
Gesamtsumme in EUR:			200.000,00	

Darlehen

Kontonummer	Produktbezeichnung	Währung	Kontostand	Nominal-zinssatz	Zinsbindungs-art	Vertrags-/ Festzins-ablauf
20044636	sonst. priv. Finan	EUR	-200.000,00	2,00000	fest	30.08.2014
Gesamtsumme in EUR:			-200.000,00			

Quelle: Richard Werner

←**Das neue Bankkonto** von Richard Werner bei der Raiffeisenbank Wildenberg am 7. August 2013

rie hinters Licht geführt und gigantische Reichtümer zusammengerafft. Aber das ist eine andere Geschichte und hängt mit der Gründung der drei maßgeblichen westlichen Notenbanken Bank of England (BoE) 1694, US-Federal Reserve System (Fed) 1914 und der Europäischen Zentralbank (EZB) am 1. Juni 1998 zusammen. Jede ist in ihrem Bereich als „Bank der Banken" Statthalter und Bewahrer dieses Systems. Dazu gehören auch die per Definition geschaffenen Bilanzierungs-Regeln der Geschäftsbanken. Denn die sind alles andere als logisch und durchsichtig, wie jeder Bankprüfer bestätigen wird. Letztlich ist die Erzeugung von Kredit und damit Geld heute nichts weiter als ein simpler Buchungsvorgang auf dem Computerbildschirm. Und ein willkürliches Prozedere, um dem Nullsummenspiel der doppelten Buchführung Genüge zu tun. Man könnte meinen, diese Art der doppelten Buchführung sei genau dazu geschaffen worden.

MEGA-GEWINNE DER GROSSBANKEN DURCH EIGENE GELDSCHÖPFUNG

Die Riesengewinne der internationalen Großbanken sind nun ebenso erklärlich wie die weltweite Verschuldung von 199 Billionen US-Dollar per 2. Quartal 2014. Festgestellt vom McKinsey Global Institute (MGI). Das waren um 57 Billionen mehr als im 4. Quartal 2007 und um 112 Billionen oder 118,7 Prozent mehr als im 4. Quartal 2000. Das heißt, dass die weltweiten Schulden um jährlich 7,7 Billionen Dollar (2000-2007) bzw. 8,8 Billionen Dollar (2008-2014) zugenommen haben. Davon sind rund 20,1 Prozent privaten Haushalten zuzurechnen, 22,6 dem Finanzsektor, 28,1 Unternehmen (ohne Finanzsektor) und 29,2 Prozent den Staaten. Abgeleitet von den erwähnten Jahreszuwachszahlen dürfte sich die Verschuldung der Welt bei den Finanzinstituten inzwischen per Ende 2015 auf rund 212 Billionen US-Dollar summiert haben. Ist schon die Gesamtsumme beängstigend, dann umso mehr der jährliche Zuwachs. Denn wie soll das alles je zurückgezahlt werden?

Zu denken gibt dies in mehrfacher Hinsicht:

1. Zunächst müssen von den Schuldnern jährlich Zinszahlungen geleistet werden. Die liegen je nach Zinssatz zwischen 7,43 (bei einem Zinssatz von 3,5 Prozent) und 11,7 Billionen Dollar (bei 5,5 Prozent) p.a. Und sind nicht durch Geldschöpfung gedeckt. Der Zinsleistung entspricht daher zwangsläufig in etwa die jährliche Zuwachsrate der Welt-Verschuldung.
2. Versteht man Kredit als Wertschöpfungsversprechen, aus dem der Kredit einmal „zurück" gezahlt werden soll, und nimmt man dies für das gesamte weltweite Kreditvolumen, dann stellt man Unerwartetes fest: Dieses Wertschöpfungsversprechen betrug Ende 2014 das etwa 2,6-Fache des weltweiten Bruttoinlandsprodukts (BIP), also des Volumens von Waren und Dienstleistungen in Höhe von 77,3 Billionen US-Dollar (2014).1970 war es weniger als das Anderthalbfache. Nimmt man eine durchschnittliche Kredit-Laufzeit von zehn Jahren an, dann müssten jährlich rund 20,3 Billionen Dollar Luftgeld-Rückzahlung plus – wiederum durchschnittlich – 9,5 Billionen an Zinsen geleistet werden. In Summe somit knapp 30 Billionen Dollar oder fast 39 Prozent des weltweiten BIP. Hier fließt also eine gewaltige Summe alljährlich von der Realwirtschaft in die Finanzwirtschaft, 9,5 Billionen Dollar an Neuverschuldung in die umgekehrte Richtung.
3. Um die Wertschöpfung für die Kreditbedienung dauerhaft leisten zu können, werden Naturressourcen verbraucht – das Ausgangsmaterial, das in Wertschöpfung übergeführt wird. Und mit unserem derzeitigen Know-how und mit unseren Fabriken, das heißt allen Technologien, mit denen wir Wertschöpfung leisten können – zusammengefasst unter dem Begriff „Kultur" –, verbrauchen wir derzeit, für das heutige Volumen an Waren und Dienstleistungen, schon die natürlichen Ressourcen von 1,5 Planeten, wie der Zukunftsforscher Dirk Solte errechnet hat. Das ist der Grund, weshalb wir ein Umweltproblem haben, das immer schlimmer wird. Und es wird noch schlimmer, wenn alle der derzeit 7,3 Milliarden Menschen an den Konsum westlichen Standards herangeführt werden.
4. Eines der Kernprobleme der Finanzindustrie ist die Haftungsfrage. Denn es ist der internationale Buchhaltungsstandard des „Fair Value", der das ökonomische Grundprinzip, dass Angebot und Nachfrage den Preis bestimmen, völlig ignoriert. Alle von den Banken gewährten Kredite, also alle als bankeigene Vermögenswerte gehaltenen Schuldverschreibungen, werden so bewertet, als würde man sie jederzeit zum „Fair Value" verkaufen können, als würde es eben einen Markt mit unendlich vielen Nachfragern geben, die im Fall des Falles zugreifen und sie zu diesem Preis kaufen. Allerdings ist dieser Fair Value reine Fiktion, wie sich in der Krise herausgestellt hat. Dies ist auch der Grund, warum die Zentralbanken bei den Banken auf eine Erhöhung des haftenden Eigenkapitals dringen. Nur: Wie soll das funktionieren, wenn keiner mehr auf die Rückzahlung von Krediten vertraut?

DIE HUNDERTJÄHRIGE KONTROVERSE IST BEENDET

Fragen über Fragen, die der Antwort harren. Doch wenigstens kann eine mehr als hundertjährige Kontroverse beendet werden: Jene über die Geldschöpfung. Die beiden zuletzt gängigen Theorien mit einander ausschließenden Ansichten erweisen sich jedenfalls als Pseudowissenschaft und Irrlehre und deren Vertreter bis in die höchsten Ränge der Wirtschaftswissenschaften als Scharlatane. Sie hatten in der Literatur umfang- und wortreich ungeniert falsche Thesen verbreitet, die Vertreter der „Kreditschöpfungstheorie" regelrecht denunziert und die Wahrheit verschleiert. Dies begann übrigens, rein zufällig natürlich, in der Zeit unmittelbar nach der Gründung des Fed, mit dem in den USA das Luftgeld-System einzementiert wurde. Zum Wohle der Wall Street-Banken.