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Saving does not finance Investment: Accounting as an indispensable guide to economic theory

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Working Paper

Fabian Lindner¹

Saving does not finance Investment: Accounting as an indispensable guide to economic theory

Abstract

The paper analyses the accounting relationships between the financial and the real economy. It will be shown that accounting can clarify the nature of economic phenomena and be an important building block for economic theory. The paper will argue that there is much confusion about key macroeconomic concepts like saving, investment and finance. This confusion is best summarised in the statement “saving finances investment”. After clearly defining the accounting relationships between lending, financial saving and physical investment it will be shown that this is a nonsense statement. The theory behind it – the loanable funds theory – will be analysed and critiqued. It will be shown that the loanable funds theory confuses the concepts of income and production, lending and saving, and financial saving and non-financial saving. It will further be shown that this has not only theoretical but also important policy implications.

Keywords: Saving, Wealth, Capital, Investment, Production, Financial Markets, Macroeconomics, Money and Credit.

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Saving does not finance Investment: Accounting as an indispensable guide to economic theory¹

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Abstract:

The paper analyses the accounting relationships between the financial and the real economy. It will be shown that accounting can clarify the nature of economic phenomena and be an important building block for economic theory. The paper will argue that there is much confusion about key macroeconomic concepts like saving, investment and finance. This confusion is best summarised in the statement “saving finances investment”. After clearly defining the accounting relationships between lending, financial saving and physical investment it will be shown that this is a nonsense statement. The theory behind it – the loanable funds theory – will be analysed and critiqued. It will be shown that the loanable funds theory confuses the concepts of income and production, lending and saving, and financial saving and non-financial saving. It will further be shown that this has not only theoretical but also important policy implications.

¹ The author thanks Uwe Richter, Erik Klär, Andrew Watt, Nikolaus Kowall and Philipp Hauber for their detailed critiques. The remaining errors remain of course the author's.

1) Introduction

“Economists do not tire of impressing on their students that money and real capital are not the same thing, that interest on capital and interest on money are consequently different things. But as soon as it comes to applying these ideas, almost without exception “the subjects are mixed up in the most inextricable confusion”, as Mill puts it (at the opening of an argument in the course of which, in spite of every effort, he merely succeeds in adding to the confusion).” Knut Wicksell (1936, p. XXV)

“Unterstellen wir, die Einkommenbezieher würden durch eine wirkungsvolle Propaganda veranlaßt, weniger auszugeben und mehr zu sparen! So etwas wäre zwar ein Schuldbürgerstreich, aber durchaus nicht außer dem Bereich der Möglichkeit. [...] Würde nun wirklich mehr gespart, so könnte auch der Beschäftigungsstand nur aufrechterhalten werden, wenn die Investition ausgedehnt würde. [...] Was wir hier so etwas umständlich ausdrücken, wird einfacher, und durchaus klar in diesem Falle, durch die altbekannte Formel zum Ausdruck gebracht, „wenn mehr gespart wird, kann mehr investiert werden und wird mehr investiert“; aber in dieser Form gilt sie nicht. Die Formel drückt nur ein „Sollen“ aus, es müßte so sein, damit nicht ein höchst unerwünschter Erfolg, nämlich ein Rückgang der Produktion und der Beschäftigung eintritt.“ Wilhelm Lautenbach (1952, p. 61-62)²

Many – if not most – economists argue that “saving finances investment”. In this paper we will try to clarify why this statement is wrong and how its falsehood is due to the confusion of quite different economic concepts. By using basic accounting concepts and rules, we will show that saving cannot finance anything. To do so, those accounting concepts and rules – while basic – have to be made explicit and then applied to economic theory. The clear definition of different economic concepts and phenomena (what exactly is saving, what exactly is a credit etc.) is the first step for a deeper analysis of the links between financial markets and the “real” economy.

Much rather dry accounting will be presented in this paper. However, this presentation is necessary in order to understand the “problem entanglements”³ into which much of current

² “Let us assume that income receivers, led by an effective propaganda campaign, would spend less and save more! Such a thing would be a foolish act but not beyond the realm of possibility. [...] If people actually saved more, the level of employment could only be maintained if investment would be expanded. [...] What we express here in a somewhat cumbersome way can be expressed more easily and clearly by the well-known formula that “if people save more, there can be more investment and there will be more investment”; however, in this formulation, the formula is not valid. The formula only expresses that it would have to be that way so that a highly undesirable consequence can be avoided, namely a decline of production and employment.”

³ Schmidt provides an excellent overview over Stützel’s work to which the present paper owes very much (Schmidt 2009; 2012). It is hard to identify Stützel with an economic school. He wrote that he is mostly indebted in his thinking to Wilhelm Lautenbach, an economist who worked in the German ministry of finance before the Second World War. Lautenbach is counted among a German Keynesian before Keynes (Klausinger

economic theory and thus also contemporary economists are woven. The strict application of simple and somewhat trivial accounting rules to show the fallacies of economic theory has been heralded by the German economist Wolfgang Stützel in two books (Stützel 1978; 1979). Stützel has proposed the term “problem entanglement”⁴ to describe how many economists tend to confuse concepts and economic phenomena that are quite distinct and thereby derive conclusions that are not logically valid and are likely to lead to false policy conclusions.

In this paper, one of the most deeply ingrained “problem entanglements” in economics will be further analysed and criticized: the loanable funds theory, which states that “saving finances investment”. A critique of this theory is important for two reasons: first, holding on to this theory is an impediment to a clear understanding of the real economy we actually live in; second, the critique shows how a clear understanding of accounting can help to avoid fallacies.

Accountants need precise concepts to measure economic variables and phenomena. Thus, a thorough understanding of accounting is the first step towards understanding what kind of economic phenomena one deals with. The advantage of accounting rules, once defined, is that they can be used to derive logically strictly true deductions. Stützel stresses that it is strange that so much of economics has been founded on behavioural assumptions which are by nature highly disputable and not aimed at a clearer understanding of the strict and undisputable rules that bind economic units together: the rules of accounting:

“Vor lauter Skepsis gegenüber der Allgemeingültigkeit solcher Aussagen [statements that concern the behaviour of people] wird aber leider manchmal übersehen, daß es neben Zusammenhängen, die vom menschlichen Verhalten abhängen [...] viele Größenbeziehungen in der Wirtschaft gibt, über die sich streng Allgemeingültiges aussagen läßt, Zusammenhänge, die *nicht* [emphasis in the original] vom menschlichen Verhalten abhängen, sondern auch dann unverändert bestehen bleiben würden, wenn die Menschen sich noch so ungewöhnlich verhielten.” (Stützel 1978, p. 2)⁵

In his work, Stützel shows how two trivial and strictly true statements can be used to understand the interrelations between the real and the financial economy:

1999). Further, many parallels can be found between Stützel and Knut Wicksell’s (Wicksell 1936) work. Also, readers familiar with post-Keynesian economic theory will see that many of the concepts developed by Stützel are consistent with post-Keynesian theory, especially with Minsky and Kalecki.

⁴ In German: “Problemverschlingung”

⁵ “The sceptics about the generality of such statements [statements concerning the behaviour of people] sometimes overlook that, besides relations that depend on human interaction [...], there are many relations in the economy about which there can be strictly generalized, relations that do *not* [emphasis in the original] depend on human behaviour but that are valid even if people behaved in completely abnormal ways.”

- i. an economic unit's expenditure is another one's revenue – there is no seller without a buyer and vice versa;
- ii. for every financial asset there is a corresponding financial liability – there can be no creditor without a borrower.

In this paper, we derive important insights from those two trivial economic truths. The remainder of the paper is structured as follows: the second section will first present a simple analytical framework developed by Stützel within which fallacies of composition can be detected. Then, important accounting principles and concepts are explained. Most notably, the spheres of financial wealth, of means of payment, and of the production of goods and services will be clearly distinguished and their interaction both on the individual as well as on the aggregate level will be explained. All the concepts here presented are used today in national and financial accounting.

Having clarified – and hopefully “disentangled” – key concepts in the relation between finance, investment and saving, the third part will tackle the neoclassical loanable funds model. It will be shown that its problem entanglements can lead to misguided economic policies. A fourth part will conclude.

2) Accounting

Before discussing the accounting rules an analytical framework by Stützel (1978) is presented that makes it easy to clearly understand the accounting relationships between single economic units and the aggregate economy and will be very useful in detecting fallacies of composition.

a. How to beware of fallacies of composition

Fallacies of composition are statements that wrongly apply facts that are true for an individual economic unit or a group of economic units to the sum of all economic units. A common illustration of a fallacy of composition is the case of a theatre, in which a single spectator stands up to improve his view. If nobody else stands up, he will be successful in improving his view. However, if everybody in the theatre stands up, nobody will have improved his view. Clearly, saying that everybody can improve his view by standing up would be a fallacy of composition.

Stützel applies the simple setting of the theatre to the economy and distinguishes three levels of analysis. First, there is the *aggregate* economy. This is the sum of all economic units (the sum of all enterprises, all households, all government institutions etc.). In the example, it would be the sum of all spectators in the theatre. By *Groups* he means at least one economic unit less than the aggregate.

In an economy, there can be the group of all enterprises or the group of all households or the group of all non-banks, non-households etc. All groups and aggregates are composed of *individual economic units*, for instance single households or firms.

For any group (or individual economic unit) there is always a *complementary group*. The sum of the group and its complementary group is the aggregate economy. If there are N economic units in the economy and a group consists of j economic units, its complementary group – the rest of the economy – consists of $N-j$ economic units.

It will be shown that many statements for a group are only true if the complementary group (the rest of the economy) behaves in a certain way. For instance, if we look at the group of all firms in an economy, its complementary group are all non-firms (which are all households, the government sector and the foreign sector, i.e. the rest of the world). The relation between a group and its complementary group can be easily shown with the theatre example: in the theatre, a group of spectators can only improve its view by standing up if its complementary group – all other spectators in the theatre – remains seated.

Three types of statements can be made about groups and individual economic units that compose the economy, their interrelations and the aggregate economy:

- First, there are statements that are true for individual economic units or groups. Those are *partial statements*. Applied to the theatre example: An individual or a group can improve its view by standing up.
- Second, there are *relational statements* that explicate the exact conditions under which partial statements hold true. Those statements will show that the success of an individual's or a group's actions depend on the actions of its complementary group. For instance: A group of spectators can only improve its view by standing up if the complementary group does not stand up.
- Third, there are statements that are true for the aggregate economy. They are called *global statements*. For instance: If all spectators stand up, nobody has improved his view. ⁶

Using this analytical framework, the definition of a fallacy of composition can be stated more precisely: A fallacy of composition is the application of partial statements to the aggregate economy.

⁶ In German, Stützel (1978, p. 25) has used the following terms for the three statements: Partial statements: "Partialsätze"; relational statements: "Größenmechanik"; global statements: "Globalsätze".

b. Stocks

The basis for the following discussion is Stützel (1978). The English terms used are consistent with modern accounting concepts for corporate accounting (Alexander und Nobes 2007), national accounting (Lequiller und Blades 2006) and the integration of national and financial accounting (Bond, Martin et al. 2007). Using those concepts, we will first discuss the balance sheets of economic units which contain the stocks of their financial assets, their non-financial assets, their liabilities and their net worth. Then, we will discuss how different kinds of flows change the balance sheet. This framework will show how economic units are linked both by flows of transactions (payments, sales etc.) and by stocks of claims and debts. In the economy, there can be no seller without a buyer and no debtor without a creditor. Thus, with the appropriate accounting framework, all transactions and debtor-creditor relationships can be depicted. Based on those links, economists can theorise how the actions of some economic units, for instance buyers, influence other economic actors, for instance sellers. Since economic units are linked by flows and stocks, the action of a single economic unit or a group of economic units necessarily influences the economic situation of other economic units: the economy is a social phenomenon.

The balance sheet

We will first look at the *stock* of assets and liabilities recorded in the balance sheet that every economic unit has (whether implicit or explicit). Then we will look at *flows* between two points in time lead to changes in the balance sheet. Balance sheet items for individual economic units and groups will be written in small letters while the aggregates will be written in capital letters. Every balance sheet is composed of assets (*a*), liabilities (*l*), and net worth (*nw*) (figure 1):

$$1) \ a = l + nw$$

Assets can be divided into financial assets (*fa*), and non-financial assets, (*nfa*):

$$2) \ a = fa + nfa$$

Financial assets are claims on another economic unit which correspond to liabilities of these units.⁷ In turn, financial assets can be divided into means of payment (m), and all other financial assets (ofa), (like bonds, loans, equity etc.):

$$3) \quad fa = m + ofa$$

This distinction is important because means of payment are special financial assets. As the term already makes clear they are used to make payments, for instance to buy goods and services, to purchase other financial assets or to pay back debt, make interest payments etc. One could also use the term “money” instead of means of payment or “cash”. However, in order to be as precise as possible, only the term “means of payment” will be used. The term is a precise definition of one function of money, i.e. being a means of payment, and not, for instance, being only a unit of account.

However, what exactly constitutes a means of payment depends on the circumstance. For an economic unit in the Eurozone, a dollar is most likely only just another financial asset (a claim vis-à-vis the US central bank Federal Reserve). Most payments in the Eurozone can only be made in euros. Also, non-bank economic units most often accept deposits at a commercial bank as a means of payment. For instance, wages are nowadays typically paid into an employee’s bank account and not in the form of central bank money (coins and notes) in an envelope. Banks among themselves, however, only accept central bank money and not their respective deposits. Thus, while bank deposits are normally a means of payment for non-banks, they are not a means of payment for banks.

Further, if people decided to accept stock options – or any other financial claim as means of payment (for instance if managers and workers are paid in stock options), stock options would become monetized and change from the category “other financial assets” in equation 3) to the category “means of payment”.

A further important accounting identity is that total net worth is equal to the sum of financial net worth (fnw) and non-financial assets (nfa):

$$4) \quad nw = fnw + nfa$$

⁷ This is not always the case. For instance, if monetized metals (gold and silver) are used as means of payment, they are also financial assets. But there are no corresponding liabilities to monetized metals. However, since monetized metals are no longer used as means of payment in modern economies, we will not consider them any more, so that all financial assets are assumed to have a corresponding liability.

Financial net worth (fnw) is the sum of all financial assets (fa) minus all liabilities (l) of an economic unit:⁸

$$5) \quad fnw = fa - l$$

Contrary to non-financial assets, all financial assets are a claim and thus have a corresponding liability. Figure 1 shows the complete balance sheet for an individual economic unit or a group with all the different items that have been defined here.

Figure 1: Balance sheet of an individual economic unit or a group of economic units

Assets	Liabilities and net worth
Non-financial assets	Liabilities
Financial assets - Means of payments - Other financial assets	
	Net worth

Relations between groups and the aggregate economy

Here, we will look closer at *financial* assets and liabilities. Every financial asset is a financial claim and thus has a corresponding liability. Accordingly, the aggregate economy's *financial* net worth (either of a closed economy or the world economy) is necessarily equal to zero:

$$6) \quad \sum_{i=1}^N (fa_i - l_i) = FA - L = FNW = 0$$

⁸ Another commonly used term for "financial net worth" is "net financial assets".

Note that equation 6) only looks at the face value of both financial assets and liabilities. Many financial assets are traded on financial markets so that their face value and their market value may differ. If financial assets would be valued at market prices in equation 6), aggregate financial net worth could differ from zero. For instance, in the US Flow of Funds statistics, assets are valued at their market value. In the “Integrated Macroeconomics Accounts for the United States” which combines and harmonises the US national accounting statistics with the financial statistics of the Flow of Funds of the Federal Reserve, there is an extra item that also measures the changes in valuation of assets and adds those to the flows of net financial assets and liabilities to derive the changes in the balance sheet (Bond, Martin et al. 2007). However, here we will concentrate on the face value in order to derive strict relations between the variables. This is of course not to deny that the market valuation and its changes can have substantial implications for the real economy.

From this, a simple but important consequence can be drawn: For the whole economy, aggregate net worth (nw) only consists of non-financial assets (nfa):

$$7) \quad NW = \sum_{i=1}^N (nfa_i + fa_i - l_i) = NFA + FNW = NFA$$

It is also common to designate the sum of all non-financial assets as the capital stock, K . Equation 7) shows that, by pure accounting, the *aggregate* (closed or world) economy cannot save in the form of financial assets but only in the form of non-financial assets.

Single economic units or groups can of course have positive and negative financial net worth. But this is only possible if the complementary group – all other economic units in the economy – holds the offsetting item. If we divide the total holdings of financial assets and liabilities from equation 6) of all N economic units into the holdings of a group (consisting of j economic units) and its complementary group (consisting of $N-j$ economic units), we obtain:

$$8) \quad \sum_{i=1}^j (fa_i - l_i) = - \sum_{k=j+1}^N (fa_k - l_k)$$

Thus, a group can only hold net financial wealth different from zero if the complementary group has the matching balance: a group can only be a net creditor if the complementary group is a net debtor. Those aspects can be summarised in the respective statements proposed by Stützel:

Partial statement: Each group or individual economic unit can hold financial net worth different from zero.

Relational statement: Each group or individual economic unit can only hold financial net worth different from zero to the extent that the complementary group holds the corresponding offsetting item.

Global statement: The aggregate economy's *financial* net worth is equal to zero. Thus, its total net worth is equal to the stock of non-financial assets. This is true for the world or for closed economies. Open economies are groups of economic units and are thus dealt with in the partial statement.

Figure 2: Balance sheet of the aggregate (closed or world) economy

Assets	Net worth
Non-financial assets	Net worth

Figure 2 shows the balance sheet for the aggregate economy. Those statements do not only apply to the *stock* of financial net worth, but also to *changes* of financial net worth. This will be further discussed under the heading “saving” below.

c. Flows

The length and composition of the balance sheet is changed by flows between two points in time. Two kinds of flows are distinguished here. First, there are flows that change financial net worth. Flows that change financial net worth are called *expenses* and *revenues*. Second, there are flows that change the stock of means of payment. Those flows are called *receipts* and *payments*. After having discussed those two kinds of flows, income and production will be looked at in more detail. *Non-financial* net worth can only change by the acquisition, disposal or production of non-financial assets.

Current transactions and changes in financial net worth

Flows that change financial net worth are called *expenses* and *revenues*. Those consist of current transactions like the sale of goods and services, labour and capital income, transfers, taxes and subsidies, gifts etc. Both are booked in the *current account*. I explicitly use the term “current account” although it is normally applied to national economies. However, not only national economies sell and

buy goods and services and spend and receive wage and capital income and transfers. Every economic unit does. The rules that govern the accounting of expenses and revenues are the same to whatever economic unit or group of economic units they apply.

If an economic unit's revenues exceed its expenses, it will register a current account surplus. For instance:

- a bank that receives more interest revenues from its debtors than it has to pay to its depositors realises a current account surplus;
- a firm that receives more revenues from the sale of goods than it pays to its creditors and its workers has a current account surplus (and also a profit);
- a household that receives more labour or other income than it spends on consumption or other goods has a current account surplus etc.

Accordingly, if an economic unit spends more than it receives in revenues, it has a current account deficit.

All current account transactions have to be financed. The financing of any transaction is recorded in the *financial account*. Also, any change in financial assets (*fa*) and financial liabilities (*l*) that is not linked to a current account transaction is recorded in the financial account. Financial net worth (*fnw*) changes if there is a current account surplus or a deficit, i.e. if the balance of revenues (*r*), and expenses (*e*), is different from zero:

$$9) \quad r - e = \Delta fa - \Delta l = \Delta fnw$$

An economic unit can *finance* its current account deficit by depleting its financial assets, *fa*, (among them its means of payment) and/or by increasing its liabilities; correspondingly, an economic unit with a current account surplus decreases its liabilities and/or increases its financial assets.

Let us illustrate the point by using the example of a baker and his customer. If the customer buys bread from the baker, the customer incurs a current account deficit vis-à-vis the baker. He can finance this deficit in two ways. Normally, a customer in a shop uses central bank money (coins in his wallet) to pay. Since central bank money is a financial asset (claim on the central bank), the payment in coin decreases the customer's financial net worth by the amount of his expenses. On the other hand, if the customer did not pay but only promised to pay later (perhaps because the baker and the customer know and trust each other), he would incur a debt vis-à-vis the baker, thus increasing his liabilities.

Every transaction is a two-sided affair. The customer's expense is the baker's revenue. Thus, the baker has a current account surplus vis-à-vis the customer if he sells the bread. The payment in coins leads to an increase in the baker's financial assets – a claim vis-à-vis the central bank. If the baker gives the customer a loan, he adds a financial claim vis-à-vis the customer to his balance sheet.

The purchase of the bread thus leads to four entries into the customer's and the baker's books:

- First, the expense for the bread in the customer's current account;
- second a decrease of financial assets or an increase in his liabilities recorded in the customer's financial account;
- third, a revenue (the bread sold) in the baker's current account and
- fourth, an increase in financial claims in the baker's financial account.

If we assume that nothing else happens in this period, the customer has a current account deficit and the baker a corresponding current account surplus. Nothing fundamental would change if the transaction took place between a Greek entrepreneur and a German manufacturer or any other economic unit by way of any other current transaction.

Relations between groups and the aggregate economy

As the example with the baker and his customer has shown, any economic unit's current account surplus and the accompanying increase in its financial net worth is necessarily another economic unit's current account deficit and a corresponding decrease in its financial net worth. This is the logical consequence of an expense of any economic unit i being the revenue of another economic unit j and vice versa:

$$10) \quad r_i = e_j$$

Thus, the sum of all revenues equals the sum of all expenses:

$$11) \quad \sum_{i=1}^N r_i = \sum_{i=1}^N e_i$$

This means that the *aggregate* economy cannot realise a current account surplus or deficit. Equation 11) implies $\sum_{i=1}^N (r_i - e_i) = 0$. However, *groups* or individual economic units can of course realise current account balances. One can demonstrate that by dividing expenses and revenues into

the expenses and revenues of a group and its complementary group. The group consists of j individual economic units and its complementary group of $N-j$ economic units:

$$12) \sum_{i=1}^j r_i + \sum_{k=j+1}^N r_k = \sum_{i=1}^j e_i + \sum_{k=j+1}^N e_k$$

Re-arranging the terms yields:

$$13) \sum_{i=1}^j (r_i - e_i) = - \sum_{k=j+1}^N (r_k - e_k)$$

That means that groups can only realise current account deficits or surpluses if the complementary group has the corresponding surplus or deficit. Further, using equation 9) (the relation between financial net worth and net expenses) yields:

$$14) \sum_{i=1}^j (r_i - e_i) = - \sum_{k=j+1}^N (r_k - e_k) = \sum_{i=1}^j (\Delta fnw_i) = - \sum_{k=j+1}^N (\Delta fnw_k)$$

This shows that the three statements derived above about the *stock* of financial net worth are also applicable to the *change* in financial net worth. The relation between the current account balances of groups and the aggregate economy can again be summarized using Stützel's terminology:

Partial statement: Each group or individual economic unit can realise a current account surplus (deficit) and increase (decrease) its financial net worth by spending less (more) than it earns.

Relational statement: Each group or individual economic unit can only realise a current account surplus (deficit) and the corresponding change in financial net worth to the extent that the complementary group realises a current account deficit (surplus) of the same absolute amount.

Global statement: The economy as a whole cannot realise current account surpluses or deficits because the sum of all expenses is necessarily equal to the sum of all revenues. Correspondingly, the aggregate economy cannot increase or decrease its *financial* net worth. This is true for the world or for closed economies. Open economies are groups of economic units and are thus dealt with in the partial statement.

Some important clarifications of terms

Before going further, it is important to clarify the exact meaning of some terms that have led to confusion and misunderstanding in many debates. Those terms are: “net lending / net borrowing” and “net capital export / net capital import”. A financial account surplus or deficit that accompanies a current account surplus or deficit is also called *net lending* (for a current and financial surplus) and

net borrowing (for a current and financial deficit). This is the standard term used for a financial surplus or deficit in national accounting (Lequiller und Blades 2006). In international economics, the same phenomenon is also often called *net capital export* (for the surplus) and *net capital import* (for the deficit). Those terms are very misleading and cause much confusion.

This is most easily shown by again looking at the baker and his customer. The baker's net financial surplus leads to a net increase in his financial claims, either his claims vis-à-vis the central bank or vis-à-vis the customer. If the customer pays with coin, the baker has not lent any money to the customer. Only in the case in which he has given the customer directly a credit did he also directly lend to the customer. But although the actions of giving a credit and of realising a current account surplus sometimes happen simultaneously, they are different things.

Thus, the realisation of a net financial surplus (equal to a current account surplus) does *not* necessitate any actual lending on the part of the economic unit with the current account surplus. On the other hand, the customer is a "net borrower" (i.e. has a financial deficit equal to his current account deficit). In trading his coins for the bread he did not actually borrow from anybody. That means that there is no need for the two parties to lend or borrow from each other to become a "net lender" or a "net borrower".

Unfortunately, national accounts experts themselves are not quite clear on this. For instance, in an introduction to the "Integrated Macroeconomic Accounts" Bond, Martin et al. (2007) write: "The integrated accounts show that among the domestic sectors of the U.S. economy, households and nonprofit institutions, nonfinancial noncorporate businesses, the Federal Government, and state and local governments have been net borrowers in recent years when investment in these sectors has exceeded saving. Net lending to these sectors has been provided by nonfinancial corporations, financial business, and the rest of the world." (2007, p.23).

It is at least highly misleading to write that "Net lending [...] has been provided". The right interpretation of the data is that all sectors that were "net borrowers", i.e. had a financial deficit, have spent more than they received in revenues – which was only possible because the complementary groups (all other sectors) spent less than their revenues. The "net lenders" did not necessarily provide financing. Their being "net lenders" just means that they have increased their financial assets and/or decreased their liabilities. This is an altogether different thing from "providing net lending" – if by that we mean providing credit to other sectors.

How the “net borrowers” financed their deficits is not clear unless there is more information than just the financial balances. One would need the exact decomposition of those balances into changes in financial assets and liabilities to understand how those deficits have been financed. They could have been financed by depleting financial assets (for instance, by spending money held in portfolios) or by increasing liabilities (incurring debt). But who exactly provided the “net borrowers” with means of payment to finance the deficit is not established by looking only at financial balances. Recall that the baker is a “net lender”. Although he always is a “net lender” in our example, he does not necessarily provide any lending to the customer. Most often, it is banks that provide credit in the form of a means of payment, which then is used for expenses that only then lead to financial deficits and surpluses. What exactly a credit is will be explained in more detail below.

The same problems apply to the term “net capital export”. The term is regularly used for countries with a current account surplus; countries with a current account deficit are defined as a “net capital importers”. The term suggests that “capital” leaves the country when it realises a current account surplus. Again, if we take the case of the customer who has paid his bread with coin, the baker has not literally exported any “capital” but *increased* his net financial assets in the form of coin; the customer has not literally imported any capital but *decreased* his financial net worth. Those distinctions will also become clearer in the next section, in which changes of means of payment and the nature of credit are discussed in more detail.

But not only the term “net export” is misleading if one speaks of “net capital export”. The term “capital” should also be interpreted with care. It has to be stressed that here the term “capital” applies to the *financial* account so that *financial* assets are traded, not non-financial assets that are also often called “capital” (see the Wicksell quote at the beginning).

The flow of payments

Payments and *receipts* are all flows that change the stock of *means of payment* of any economic unit. This has to be distinguished from expenses and revenues that change *financial net worth*.

In the case of the baker and his customer, the transaction involving coin has led to both a payment and an expense of the customer and a receipt and a revenue of the baker. The baker has increased his financial net worth in the form of a financial asset that works as a means of payment. In the second case – the case in which the baker has sold his bread on credit –, however, the baker has increased his financial net worth but no payment has taken place, i.e. neither the baker’s nor the customer’s stock of means of payment have changed.

Now suppose the baker were not willing to sell his bread on credit since he might not know and/or trust the customer. However, the customer has no means of payment. Thus, the customer goes to the bank and withdraws money from an ATM. By doing so, he has depleted his deposits at the bank (claim vis-à-vis the bank), $-\Delta ofa_c$ ⁹, and increased his holdings of central bank money (claim vis-à-vis the central bank), $+\Delta m_c$:

$$15) \quad \Delta nfw_c = +\Delta m_c - \Delta ofa_c = 0$$

This transaction is the customer's *receipt* and the bank's *payment*. The bank both diminishes its own holdings of means of payment, $-\Delta m_b$, and its liabilities, $-\Delta l_b$, – which are the customer's deposits:

$$16) \quad \Delta nfw_b = -\Delta m_b - (-\Delta l_b) = 0$$

Neither the bank's nor the customer's financial net worth have changed since no expenses and revenues have taken place, only payments and receipts. Recall that, by definition, payments and receipts do not change the financial net worth of an economic unit, but only its stock of means of payment. Through the transaction, only their liquidity positions have changed: the bank holds fewer means of payment, the customer holds more.

After the walk to the ATM the customer returns to the baker and pays for his bread – again the customer's payment (who diminishes his stock of means of payment) and the baker's receipt (who increases his stock of means of payment). Here, payment and expense and receipt and revenue happen simultaneously.

It is clear that even if the customer had a positive financial net worth (for instance, large deposits at the bank and no debts), he could not buy the bread if he were not able to provide the only means of payment the baker accepts – coin or bank notes. If the customer does not find an ATM, he will not be able to buy the bread, even if he is the world's richest person. Likewise, a firm with a positive net worth but no means of payment and no way to provide those means of payment, for instance via a bank loan, is illiquid.

⁹ This is a further instance of the dependence on the context of the concept “means of payment”. Earlier, we had said that a deposit at a commercial bank constitutes a means of payment for non-banks, thus also for the customer. Here, however, we have just called the deposit “other financial asset, *ofa*” and the central bank money (the cash) “means of payment, *m*”. We did this to make clear that the customer needs central bank money to pay his bread bill and not a deposit at the bank.

Further, most credits are extended to provide means of payment. Imagine the customer has an account at the bank but his balance is zero. He could still withdraw money from the ATM if he has credit with the bank. The bank would then increase its financial claims vis-à-vis the customer, but decrease its claims vis-à-vis the central bank (central bank money). The bank would have exchanged two financial claims, thereby leaving its financial net worth unchanged. But it would have decreased its liquidity position. On the other hand, the customer would have increased his liabilities (debt at the bank) but increased his holdings of means of payment, also leaving his financial net worth unchanged. Both transactions would be recorded in the financial account. The financial account transaction for the bank b would read:

$$17) \quad \Delta nfw_b = +\Delta ofa_b - \Delta m_b = 0$$

Here, $+\Delta ofa_b$ is the increase in the bank's loans and $-\Delta m_b$ is the bank's decrease of its holdings of means of payment (in this case, central bank money) and thus the bank's *payment*. The financial account of customer c would read:

$$18) \quad \Delta nfw_c = +\Delta m_c - \Delta l_c = 0$$

Where Δm_c is his increase in means of payment – the customer's receipt – and $-\Delta l_c$ the liability he has incurred by borrowing from the bank. Of course, the volume of the bank's payment and the customer's receipt are the same and equal to the customer's higher liabilities and the bank's now higher other financial assets (the loan to the customer): $\Delta m_c = \Delta m_b = \Delta ofa_b = \Delta l_c$.

Again, those transactions leave the *current account* of both the bank and the customer unchanged and do not lead to changes in financial net worth. They are *pure financial transactions*. The same applies to the sale and purchase of any financial asset where other financial assets are exchanged as a means of payment. The stock exchange, much of the business of investment banks etc. are purely financial transactions that do not constitute revenues nor expenses. Of course, investment banks or brokers earn fees on those transactions. Those fees constitute revenues, which are booked on the current account; but the business of trading financial claims is a pure financial transaction. Any pure financial transaction leaves financial net worth unchanged. The provision of credit but also the repayment of credit are also pure financial transactions. Thus, although the bank (or any other economic unit) has lent money, it does not become a "net lender" (as defined above) through this transaction. This is why it is so important to clearly distinguish between expenses and revenues on the one hand and payments and receipts on the other hand.

More on credits

Let us expand on what exactly a credit is. As has already been shown, a credit is a pure financial transaction. By the creation of credit neither the borrower's financial net worth nor that of the lender is changed. By receiving a credit, the borrower increases his financial assets (he receives money) and increases his liabilities (the debt that he incurs):

$$19) \quad \Delta m_{\text{borrower}} = \Delta l_{\text{borrower}}$$

On the lender's side, two operations can take place, depending on whether the lender can himself create means of payment (like the central bank or a commercial bank) or whether he cannot. A bank that can create means of payment extends its balance sheet by simultaneously increasing – by a simple booking operation – its financial assets (the financial claim vis-à-vis the borrower) and the means of payment (deposit creation):¹⁰

$$20) \quad \Delta fa_{\text{bank}} = \Delta m_{\text{bank}}$$

Lenders who cannot create means of payment decrease their holdings of means of payment and increase the stock of other financial assets (i.e. financial assets that are not means of payment). This is an exchange of claims (the claim vis-à-vis the central bank is exchanged for a claim vis-à-vis the borrower):

$$21) \quad \Delta ofa_{\text{lender}} = \Delta m_{\text{lender}}$$

If the borrower pays back the money he has lent, the operations are the same, but in reverse order: In the case of the bank (central bank or commercial bank), the deposit – i.e. the means of payment – is destroyed by the repayment; in the case of the lender who cannot create means of payment himself, his claims are exchanged back from a claim vis-à-vis the borrower to a claim vis-à-vis the central bank. Note again that all those transactions are only recorded on the financial account and not on the current account.

Of course, the provision of credit most often means that the borrower has to pay interest to the lender, which – in later periods – will affect the current account of both the borrower (whose

¹⁰ In contrast to the central bank, the commercial bank is restricted in its deposit and credit creation by the availability of central bank money. It needs central bank money if its depositors want to use the deposit created to make payments to other economic units than the bank. It is further restricted in its credit creation by regulation, e.g. the amount of capital it has to hold for every loan etc.

interest payments are expenses booked in the current account) and the lender (whose interest revenues are also booked in the current account). The borrower will later have to have sufficient means of payment to make both the interest payments and the final debt repayment. All financial difficulties and crises are essentially the result of borrowers not being able to get hold of means of payment to meet their debt obligations.

The discussion so far has shown that even if the bank (or any other lender) had provided means of payment, there would have been no “net lending” going on in the sense that has been discussed above, i.e. a current account surplus that simultaneously increases an economic unit’s net financial claims. Providing means of payment – which is what banks largely do – is different from being a “net lender”, i.e. an economic unit with a current account surplus and a net increase in financial assets.

The flow of income and production

Having defined flows that change financial net worth (expenses and revenues) and the stock of means of payment (payments and receipts), we turn to production and income. At first sight, one might assume income to be the sum of all revenues. However, this is not the case. An economic unit can have an income without realising either any expenses or any revenues. An economy in which economic units do not trade but only produce for themselves still has a positive income. As will be shown, aggregate income is always equal to production.

An economic unit’s income (y), is defined as the sum of consumption (c), and the change in net worth (nw):

$$22) \quad y = c + \Delta nw$$

As already defined above, the change in net worth is the sum of the changes in non-financial assets and financial assets. Since the change in non-financial assets can also be called investment, i ($i \equiv \Delta nfa$),¹¹ we can also write:

$$23) \quad y = c + i + \Delta fnw$$

Financial net worth is the difference between expenses and revenues. Thus, one part of the income concept is the change in financial net worth. Income and the concept of net revenues (i.e.

¹¹ Note that this is net investment and that, consequently, income here defined is net income, not gross income. To derive gross income, we would have to add depreciation, d , to gross investment, so that $i_{gross} = \Delta nfa + d$. That means that $i_{gross} - d = i_{net} = \Delta nfa$.

current account balances) are linked to each other. However, income is a wider concept. It also measures consumption of an economic unit and its investment. Those two concepts do not have to be linked to expenses and revenues. Income can also accrue to an economic unit that produces its consumption goods or its investment goods on its own without buying from or selling to other economic units.

For instance, Robinson on his island might have a coconut tree that is his capital stock (stock of non-financial assets). If he picks a coconut (produces a coconut) and eats it, that is his consumption. Thus, his income is equal to his production, which he then consumes. Since no selling or buying has taken place, there were no revenues or expenses. If Man Friday also produces coconuts (or anything else) and consumes them, the island's aggregate income would be equal to their joint coconut consumption. If they plant the coconut instead of eating it, they would invest it. Again, their income would be equal to the coconuts they produced in a period but their production would have been used differently, i.e. not for consumption but for investment. Still, their aggregate income is again equal to their aggregate production.

The same applies to a monetary economy. Assume a monetary economy in which a corporate sector, cs , produces goods and services, and a household sector, hs , consumes those goods and services. Households work for firms and get paid by them. They receive revenues in the form of wages and realise expenses by buying goods and services; the firms' wage payments are their expenses, sales of goods and services are their revenues. Households' income thus is:

$$24) \quad y_{hs} = c + r_{wages} - e_{consumption\ goods}$$

Firms' income is:

$$25) \quad y_{cs} = i + r_{consumption\ goods} - e_{wages}$$

Thus, households receive wages, which are their revenues, and they consume; depending on the amount of consumption relative to their revenues, they will either increase their financial net worth (less consumption than revenues) or decrease their financial net worth (more consumption than revenues). Thus, their income equals their consumption plus the change in their financial net worth.

The corporate sector does not consume but only invests. Note that its investment is the sum of its additions to machines and other items (its capital stock proper) and its new inventories, i.e. goods meant to be sold but not (yet) sold. Consumption expenditures would thus lead to a depletion of inventories, i.e. $c = -i$ (as long as households do not produce on their own).

Again, in the aggregate, income is equal to production, whether output is used for consumption or investment. Again, aggregate revenues and aggregate expenses are the same and net out in the aggregate so that aggregate income of all N economic units is:

$$26) \quad Y = \sum_{i=1}^N y_i = \sum_{i=1}^N (c_i + i_i + r_i - e_i) = C + I$$

This can again be precisely summarised in the now familiar three statements:

Partial statement: Each group's or individual economic unit's income can be greater or smaller than its consumption and investment.

Relational statement: A group's income can only be greater (smaller) than its consumption and investment if another group decreases (increases) its net financial worth.

Global statement: For the aggregate economy, income is equal to production in a period. Again, open economies are groups and are dealt with in the partial statement.

What is saving?

Using the concept of income, one can easily define saving. For any economic unit, saving, s , is the change in overall net worth, i.e. both the change of non-financial assets and financial net worth:

$$27) \quad s \equiv \Delta nw = i + \Delta fnw$$

Thus, income minus consumption is equal to saving:

$$28) \quad \begin{aligned} y - c &= s \\ &= i + \Delta fnw \end{aligned}$$

This is an important – although trivial – insight: Saving is the sum of an increase of *financial* net worth (zero in the aggregate) and *non-financial* net worth. For convenience, in the following discussion, we will often use the term “financial saving” for an increase of financial net worth. Financial saving is neither identical to investment nor is it necessary for investment to take place. Remember Robinson: He planted the coconut he picked from the tree. His picking is his production, his planting investment, i.e. his non-financial investment. But no *financial* saving has taken place on his island!

Some examples are given to better understand this accounting identity. In an economy without money and debt, each economic unit's income always equals its production of goods and services.

Thus, in such an economy, the global statement about income is equal to the partial statement. In an economy with money and debt, there is a specialisation so that most economic units do not produce themselves the items they consume or invest. Firms buy investment goods, pay wages and interest (expenses) and receive revenues from their sales; households buy consumer goods (expenses) and receive revenues from their labour and capital income.

It has already been made clear by looking at the balance sheet that the aggregate economy's net worth (in a closed economy or the world economy) only consists of non-financial assets. The same applies to *changes* in net worth for the whole economy. Summing over all income, consumption and saving (financial and non-financial) of individual economic units yields:

$$\begin{aligned} \sum_{i=1}^N y_i &= \sum_{i=1}^N (c_i + \Delta n w_i) = \\ 29) \quad \sum_{i=1}^N (c_i + i_i + \Delta f n w_i) &= \\ Y &= C + I \end{aligned}$$

The term $\sum_{i=1}^N \Delta f n w_i$ is necessarily equal to zero since all financial claims and all financial liabilities sum to zero (since there is no financial claim without a liability) and because all expenses are necessarily equal to all revenues (since there is no revenue without an expense). Further, aggregate investment, I , are only *newly produced non-financial assets*. Non-financial assets that already exist and are traded among economic units cancel out in the aggregate: An economic unit's increase in an already existing non-financial asset is the decrease of another economic unit's non-financial asset holding. Thus, for aggregate saving the following formula holds:

$$\begin{aligned} 30) \quad S &= \Delta F N W + I = 0 + I \\ &\Leftrightarrow S = I \end{aligned}$$

The famous formula $S = I$ is merely an accounting identity stating that net financial wealth in the aggregate is zero. Only newly produced assets are aggregate saving and add to the economy's aggregate net worth.

Note that the formula is *not* an equilibrium relation in the sense that saving and investment are brought into equilibrium here, either by interest rates (neoclassical theory) or aggregate income (some Keynesian theories). It is an identity. Investment is the production of any non-financial asset in

an economy and thus is always directly and unambiguously saving: it increases the economy's net worth.

For the aggregate (closed or world) economy, stating that "saving finances investment" is in fact identical to the statement that "Investment finances investment", or that "non-financial assets finance non-financial assets". This statement is of course absurd. The absurdity of this claim will be looked at in much more detail in the next section. It constitutes the key fallacy of the loanable funds theory.

Further, the equation makes no assumption in any way about how investment is *financed* or whether net financial wealth for individuals or groups in the economy (for instance, the household sector) is different from zero or equal to investment. The equation is valid for every economy, whether there is money and debt or only barter or indeed solely production without any trade.

Once more, the lessons on saving can be represented by the three statements:

Partial statement: Each group or individual economic unit can save (or dis-save) by changing its net financial wealth (changes in gross financial assets and/or gross liabilities) and its non-financial wealth (acquisition or disposal of non-financial assets).

Relational statement: Each group or individual economic unit can only change its net financial wealth if the complementary group changes its net financial wealth by the same amount but by the opposite sign.

Global statement: The economy as a whole cannot change its net financial wealth since it always equals zero. The aggregate economy can only save in the form of non-financial assets. Again, open economies are groups and are dealt with in the partial statement.

If somebody were to make the statement that "everybody has to save more" and means by that that all economic units have to increase their *financial* net worth, he clearly commits a fallacy of composition. An increase in financial net worth by everybody is a logical impossibility. But it does make sense if he means that everybody has to produce more non-financial assets.

The paradox of thrift

Another point is worth making. Since we know that the current account surplus (financial surplus, financial saving) of an individual or a group, g , is equal to that of its complementary group (with the opposite sign), cg , one can also write:

$$\begin{aligned}\Delta fnw_g &= r_g - e_g \\ 31) &= e_{cg} - r_{cg} \\ &= -\Delta fnw_{cg}\end{aligned}$$

Thus, the ability to save financially, i.e. to change financial net worth, depends on the behaviour of the complementary group. For instance, if all non-firms (firms' complementary group) decide to cut their expenses for goods and services, firms' revenues and thus profits will fall; likewise, if enterprises cut their expenses by either cutting wages or interest payments (perhaps through default), households lose revenues and thus income.¹²

The "paradox of thrift" is exactly this: if economic units plan to decrease their expenses in order to increase their financial net worth, they mechanically reduce their complementary group's revenues by the same amount. If the complementary group wants to maintain the magnitude of its previous financial saving, it will also cut its expenses. This will lead in turn to lower revenues for other economic units, and so forth. Consequentially, if everybody *plans* to increase their net financial wealth, there is likely to be a fall in the sum of all expenses, and financial saving will not be increased but instead fall in the aggregate. A drop in income will take place if the decrease in producer's revenues also leads to a cutback in their production.

On the other hand, the paradox of thrift does not apply to saving in *non-financial assets* by means of a higher *production* of those assets. In a non-monetary, non-debt economy, this would mean that simply more non-financial assets are produced. In a monetary debt economy, in which investment goods producers build investment goods in order to sell them, the purchase of more investment goods by households or firms means an increase in revenues of investment goods producers.

d. Summing up so far

Different concepts have been distinguished: expenses and revenues that change an economic unit's financial net worth; payments and receipts that change a unit's stock of means of payment. Overall saving is a change in overall net worth, which is the sum of changes in financial and non-financial net worth. Furthermore, it has been established that the sum of all expenses is necessarily equal to the sum of all revenues. This is why the sum of financial saving (changes in financial net worth) by all economic units in a (closed) economy is always equal to zero. The economy as a whole

¹² If they produce the same amount of consumption goods on their own that they were able to buy before their cut in revenues, they would not lose income! But this is an unlikely case in modern economies.

cannot save financially. The only way an economy can save is by increasing its non-financial wealth, i.e. its physical capital stock.

The act of producing a non-financial asset thus directly and unambiguously constitutes an act of saving. Further, financial and non-financial saving are *not* necessarily linked to each other. Even in a non-monetary economy there can be saving in terms of the production of non-financial assets. In the modern economy, however, the production of non-financial assets has to be financed. Financing most often takes place by using means of payment to acquire material and hire labour. Necessary means of payment are often borrowed (if the economic unit wanting to make the payments does not already have means of payment on its own). This act of borrowing, however, does *not* constitute or is in any way necessarily linked to (previous) financial saving.

The act of providing means of payment via a credit is a pure financial transaction. In such a transaction, the liquidity positions of economic agents are changed, but not their financial net worth. No financial saving takes place if a credit is provided nor is it necessary for such saving to have taken place previously. The change of an economic unit's liquidity position, i.e. of its stock of means of payment, is a payment or a receipt.

The terms "net lending" and "net borrowing" as well as "net capital export" and "net capital import" are therefore highly misleading terms. They describe financial account surpluses or deficits, but insinuate that credit has been provided for or, worse, that real capital (non-financial assets) is being transferred anytime there is an act of financial saving. But this is not the case. The confusion of all those different concepts (production; non-financial saving, i.e. investment; financial saving and providing means of payment, i.e. a credit) has led to serious confusions in the minds of many economists, which continue to this day. The case will be made using the example of the loanable funds theory in the next section.

3) Neoclassical Confusion: The loanable funds model

In the following, we present a prominent example of a problem entanglement: the loanable funds model (see Robertson (1934) for an early systematic exposition). As will be explained in more detail, the model confuses production, financial saving, non-financial saving and credit. This has disastrous consequences for policy because it concludes that an increase of non-firm financial saving through a reduction in consumption would necessarily lead to higher investment. However, in a monetary economy, this is not likely to be the case, as will be argued in the critique that follows the model's presentation.

a. Presentation of the loanable funds model

Robertson (1934) seems to have been the first who made the loanable funds theory explicit and who drew the famous Investment / Saving schema with the interest rate on the y axis (figure 3). However, since Robertson's analysis contains many idiosyncrasies¹³, I will present Gregory Mankiw's version of the loanable funds theory. In his textbook "Macroeconomics" (2010) he has made that theory explicit. Assuming full employment, he starts from the accounting identity of a closed economy with a government: $Y - C - G = I$. Then he introduces taxes, T , in order to derive both private saving and the saving of the government:

$$32) \quad S = (Y - T - C) + (T - G) = I$$

He goes on to call the first term "private saving" and the second "government saving". He claims that the sum of those savings is the "flows into the financial markets" and the flows "out of the financial markets (investment)". Then he assumes investment to be a negative function of interest rates. Thus, both private and government saving determine the interest rate and equilibrium investment and saving. Mankiw writes: "In fact, saving and investment can be interpreted in terms of supply and demand. In this case, the "good" is loanable funds, and its "price" is the interest rate. Saving is the supply of loanable funds – households lend their saving to investors or deposit their saving in a bank that then loans the funds out. Investment is the demand for loanable funds – investors borrow from the public directly by selling bonds or indirectly by borrowing from banks." (2010, p. 67-68).

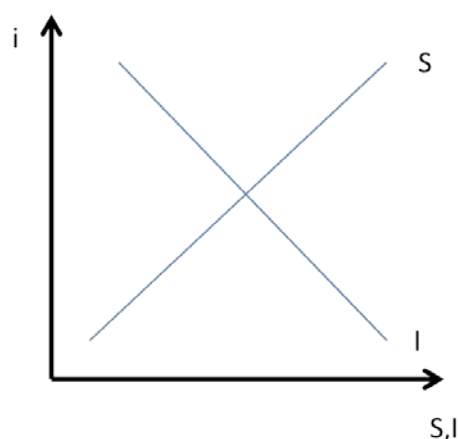
In an open economy with exports, EX , and imports, IM , Mankiw's equation would read:

$$33) \quad S = (Y - T - C) + (T - G) = I + (EX - IM)$$

Then, a lower export surplus would mean that fewer domestic saving is "exported" and more saving would be available to finance domestic investment.

¹³ Most notable is the "Robertson lag": Robertson defines saving as "disposable income" minus consumption. Disposable income is not the current period's income but last period's income (he developed this concept in Robertson (1933)). Further, he also introduces "hoarding" and "credit creation" into the loanable funds model. Thus, if "real saving" is not available to finance investment, credit creation and dishoarding could step in; on the other hand, real saving could also be hoarded so that it would not be available for investment. The detailed discussion of those points is beyond the scope of this paper. But readers could readily use the concepts developed here to find the fallacies in Robertson's views for themselves.

Figure 3: Saving, Investment and the interest rate



What are the implications of this model? In the model, the amount of saving in a period limits the amount of credit or “loanable funds”. If all saving would be used up, no more credit could thus be extended. By their saving decisions, the government and consumers would determine the size of the fund: If they increased their expenditures relative to their revenues, there would be less saving and thus fewer “loanable funds” available on financial markets. They would “crowd out” domestic investment because the “loanable funds” would not be used for investment (as though means of payment would not constantly circulate in the economy but would suddenly disappear...) ¹⁴. The decrease in available funds due to lower saving would lead to more competition on the capital market and thus to higher interest rates.

On the other hand, a decrease in consumption, the government deficit and the export balance would mean an increase in saving and thus in the availability of loanable funds, a fall in interest rates and thus an increase in investment. Less consumption, lower government deficits and lower export surpluses would lead to higher investment, a higher capital stock and thus an increase in the economy’s production capacity.

¹⁴ That the money, after having circulated once in a period, is not available for other purchases would be another way of expressing this. Robertson explicitly assumes the velocity of money to be one per period in his 1933 article on saving and hoarding (Robertson 1933, p. 399): “The form of our analysis will be much simplified if we can bring ourselves to identify [...] the period during which, at the outset of our inquiry, the stock of money changes hands once in final exchange for the constituents of the community’s real income or output. To do so, it is true, will not only take us out of touch with the facts, but will preclude us from considering the possibility of an increase in the velocity of circulation of money against output above that from which we happen to start: for our definition does not admit of a piece of money coming to do more than one job in a day.”

This theory is not Mankiw's idiosyncrasy but is at the heart of today's mainstream economics and amply used for policy advice. Three examples are given: pension policy, deficit spending and export balances. In the realm of pension policy, Börsch-Supan and Gasche (2010, p. 8) use the following identity to justify higher private saving, i.e. less consumption:

" $S_{PR} + S_{ST} + S_U = I + X - M$. Eine höhere Ersparnis S_{PR} (bzw. eine höhere Ersparnis des Staates S_{ST} oder der Unternehmen S_U) geht mit höheren Investitionen I und einem höheren Außenbeitrag $X - M$ (= Exporte minus Importe) einher. Eine Erhöhung der Investitionen I erweitert den volkswirtschaftlichen Kapitalstock und führt damit zu einer höheren Produktivität und damit zu einem höheren Sozialprodukt und einem höheren Volkseinkommen."

Thus, higher financial saving would lead to higher real investment and thus higher income. According to this view, a privatisation of pensions that would lead to lower consumption and higher financial net worth would be good for investment. (Schmidt (2012), using Stützel's concepts, has a very good critique).

As far as fiscal policy is concerned, Eugene Fama (2009) writes the following, which is partly consistent with Mankiw's account of government deficits (Mankiw assumed full employment however):

"Government bailouts and stimulus plans seem attractive when there are idle resources - unemployment. Unfortunately, bailouts and stimulus plans are not a cure. The problem is simple: bailouts and stimulus plans are funded by issuing more government debt. (The money must come from somewhere!) *The added debt absorbs savings that would otherwise go to private investment.* In the end, despite the existence of idle resources, bailouts and stimulus plans do not add to current resources in use. They just move resources from one use to another. [...] *The new government debt absorbs private and corporate savings, which means private investment goes down by the same amount* [my emphases]."

Thus, government spending always and everywhere crowds out private investment, independent of whether there is unemployment or not. Bernanke (2005) gives a good example of how loanable funds theory can be applied to an open economy:

"All investment in new capital goods must be financed in some manner. In a closed economy without trade or international capital flows, the funding for investment would be provided entirely by the country's national saving. By definition, national saving is the sum of saving done by households [...] and saving done by businesses [...] less any budget deficit run by the government. [...]"

but, in fact, virtually all economies today are open economies, and well-developed international capital markets allow savers to lend to those who wish to make capital investments in any country, not just their own. Because saving can cross international borders, a country's domestic investment in new capital and its domestic saving need not be equal in each period. If a country's saving exceeds its investment during a particular year, the difference represents excess saving that can be lent on international capital markets. By the same token, if a country's saving is less than the amount required to finance domestic investment, the country can close the gap by borrowing from abroad."

According to Bernanke, higher saving by Asia would be exported to the USA in order to finance higher investment there. This hypothesis has been called the "global saving glut" hypothesis. On the other hand, countries with export surpluses would not be able to use the saving for their own investment. Sinn (2010) has applied this view to Germany's export surpluses by Sinn (2010). Sinn argues, consistent with the loanable funds theory, that 'exported' saving cannot be used to finance domestic investment. He claims that there is a direct trade-off between domestic investment and export surpluses: "Germany exported its savings *instead* [emphases added] of using them as loans for investment in the domestic economy. [...] Germany lost a huge amount of capital under the euro *even though it urgently needed* [emphases added] the capital to rebuild its ex-communist east." (Sinn 2010, p. 7) (see Horn and Lindner (2011) for a critique on Sinn's application of the loanable funds theory to the current account).

b. Critique

The loanable funds theory's key fallacy is that it uses a model of *full-employment production* and imposes it on a monetary economy. In doing that, loanable funds theorists confuse three quite different things (for a similar distinction, see Grass and Stützel (1983, p. 351)):

- a) *Financial* saving as a decrease of expenses relative to revenues in order to increase financial net worth, i.e. $r - e = \Delta fnw$
- b) *Non-financial* saving as the production or purchase of non-financial wealth that adds to physical capital, i.e. $\Delta nfnw = i$
- c) *Financing* by the provision of means of payment via a credit, i.e. $+ \Delta m$

A credit is just a pure financial transaction in which nobody has to decrease his expenses relative to revenues, or consumption relative to income. The amount of credit available in a period is in no way limited by saving in the same period. Saving does not finance anything. If somebody receives a credit, he can use the means of payment so obtained to purchase goods and services, which will only

then increase the sum of all expenses and revenues – again without any act of financial saving beforehand.

Higher *expenses* for goods and services increase firms' revenues and might also incite them to *produce* more goods and services (either consumption or investment goods). If firms wanted to increase their own expenses by more than their additional revenues from higher sales, they *might* also need more credit – if they do not already hold sufficient means of payment (via retained profits). Again, this credit is created by a pure financial transaction and is *not* in any way linked to anybody having to decrease any expense (be it on consumption, investment goods, wages etc.).

However, quite in contrast to the real world, loanable funds theory claims that more *financing* would be available if households (or any other economic agent or group) were to *save more* financially: According to Mankiw, saving leads to “flows [of loanable funds] into the financial markets”. Thus lower expenses by households, governments or foreigners would increase the availability of *finance* for domestic firms. This is the statement “saving finances investment” and has already been shown to be wrong since it would mean that “investment finances investment”, which obviously is an absurd statement.

An altogether different thing is an economy under the *full use of all resources – capital and labour, i.e. full employment* (explicitly assumed by Mankiw). In such an economy, an increase in the *production* of a certain good (call them a “consumption good”, a “government good”, an “export good” and an “investment good”) is only feasible if the *production* of another goods is decreased. Then, the increase in production of an investment good would mean that either production of “government goods”, “export goods” and/or “consumption goods” would have to be reduced in order to free up labour and machines for additional production of “investment goods”. But this has nothing to do with either *financing* the production and/or the *purchase* (and thus the *expenses*) of any of those different goods.

Thus, the key questions for the loanable funds theory is: Does – even given full employment – the decrease of *expenses* for consumption goods lead to an increase in the *production* of investment goods? And does a decrease in consumption *expenses* lead to lower interest rates and more *financing*? In the real world, the most likely answer to all those questions is: no.

To show that, let us play through the case of a monetary economy in which households suddenly decide to reduce their consumption expenses. This scenario draws heavily on similar accounts by Lautenbach (1952) (see the quote at the beginning), Bibow (2001) and Hayes (2010). In the following,

explicit behavioural assumptions are made. Those assumption are deduced by assuming the economic agents to be rational, i.e. that they do not want to go bankrupt and want to maximise their profits.

Assume a closed non-government economy populated with a household sector, hs , and a corporate sector, cs . Further assume the economy to be initially in full employment. Now assume households to have read in a neoclassical economics textbook that the decrease in their consumption expenses would lead to higher investment. Further assume that corporations do not know the households' reading habits so that the decrease in consumption comes as a surprise to them (more serious and realistic reasons for such a behaviour will be discussed in more detail below).

The financial balances of those two sectors can be derived from the expenditure side of GDP (left side of the equation) and the income side of GDP (right hand side):

$$34) \quad C + I = \Pi + wL + iD$$

Expenses consist of households' consumption, C , and firms' investment, I . On the income side are firms' revenues, i.e. profits, Π , worker's revenues wL (being the product of wages w and employment L) and net interest income iD (being the product of interest rates, i , and the stock of debt, D). By rearranging, one can show the current account balances of the two sectors¹⁵:

$$35) \quad C - wL - iD = \Pi - I = -\Delta nfw_{hs} = \Delta nfw_{cs}$$

The expenses of one sector are the revenues of the other sector and vice versa. That means that the left hand side are financial savings by the household sector, i.e.: $C - wL - iD = e_{hs} - r_{hs} = -\Delta nfw_{hs}$. On the right hand side are the financial savings by the corporate sector, i.e. $\Pi - I = r_{cs} - e_{cs} = \Delta nfw_{cs}$

¹⁵ Note that if households produced consumption goods on their own, their income (equal to their production) would increase by the same amount, i.e. $\Delta C = \Delta wL$. But this would not give rise to any expense or revenue for individual households or the household sector. For instance, this is the case of services from owner-occupied housing. Households with their own houses "produce" housing services that are also their income but do not constitute any expenses or revenues. Thus, higher housing services increase income in the national accounts but not the sum of expenses and revenues. On the other hand, if household a produces consumption goods that he sells to household b , there would be expenses and revenues, but only within the household sector. They would net out within the household sector although income would be higher by the amount of consumption goods newly produced. Likewise, the corporate sectors' investment always is its income and thus directly increases its profits, Π . But it is neither a revenue nor an expense for the corporate sector as a whole. We could further distinguish between consumer and investment goods producers. Then, investment would be an expense for consumer goods producers and a revenue for investment goods producers.

Then, if households cut their consumption expenses by a certain amount because they plan to increase their financial net worth (believing in accordance with loanable funds theory that higher *financial* saving meant higher investment), corporations would immediately and mechanically see their revenues and profits from the sale of consumption goods fall by the same amount.

They would thus have *fewer* means of payment than before the cut in expenses. The cut in consumption expenses would not – as loanable funds theory would like us to believe – free up funds for corporations. Quite the contrary, the cut would mean that the funds the firm sector had gained from its sales before now are in the pockets and/or bank accounts of households.

However, whether the households' *plans* to increase financial saving are realised depends on the actions of the complementary group, here, the corporate sector: households would only be successful in increasing their financial net worth if corporations a) borrowed back the money they had earned by their sales before to b) maintain their own expenses – which are households' revenues (their wage and interest income).

As is rather obvious, there is no ex ante certainty that corporations, seeing their sales drop, will maintain their previous level of expenses – as loanable funds theory would like us to believe – or even *increase* their production of investment goods. Further, it is neither certain nor likely ex ante that firms would now borrow and increase their future debt service in the face of lower profits (This would increase their risk of default, i.e. its borrower's risk, see Kalecki (1937)).

Also, with a decline in its profits and its liquidity, interest rates for corporate loans are not likely to fall – again, as loanable fund theory would like us to believe – but to *increase*. With lower profits, there is a higher risk that corporations will not be able to service their debts. Banks and other lenders will probably become more cautious and are likely to increase their interest rates to account for the higher risk (Minsky 1984; Bernanke, Gertler et al. 1996; Minsky 2008b; 2008a).

Interest rates could also be stable but banks could increase their credit rationing to borrowers who have become riskier. This would cut some corporations off from the credit market even if they wanted to finance their now higher deficits (Stiglitz und Weiss 1981).

The only likely scenario in which firms are to increase their investment, debt etc. is if they expected households to increase their consumption expenses in the future. But in the real world, there is no way that households can signal today that they will increase expenses tomorrow, or indeed what goods their spending would be directed on. As Keynes nicely put it: "An act of individual saving means — so to speak — a decision not to have dinner to-day. But it does *not* necessitate a

decision to have dinner or to buy a pair of boots a week hence or a year hence or to consume any specified thing at any specified date. Thus it depresses the business of preparing to-day's dinner without stimulating the business of making ready for some future act of consumption. It is not a substitution of future consumption-demand for present consumption-demand, — it is a net diminution of such demand.” (Keynes 1936/1997, p. 210)

Now, if corporations cut expenses in line with the fall of their revenues because they do not want to take the risk of higher debt service in the face of declining profits, they will most likely first cut either employment and/or wages (wL). A cut in firm expenses, however, would necessarily mean that households face lower revenues. Thus, their initial *plans* to increase financial net worth would not be realised. If households stick to their plans and further reduced their expenses, we would see a further fall in firms' profits, a likely cut in firms' expenses, higher unemployment and so forth.

What households and corporations have found themselves in by following the prescriptions of neoclassical textbooks is the paradox of thrift: If all economic units plan to increase their financial saving, they will by necessity not be successful in it (since financial net worth is zero in the aggregate) so that the sum of expenses (equal to the sum of revenues) will fall and production and income are likely to follow.

On the other hand, a planned *decrease* in financial saving is likely to lead to an upswing. If households would like to save less financially, they would increase their expenses, which would lead to higher corporate profits, and quite possibly higher corporate investment. The economy's higher income generated in this scenario would then allow for a higher magnitude of financial savings by households despite the initial reduction in their savings rate.

Now, we can of course generalise the model populated only by households and corporations to an open economy with a government. We could tell the same story that we told for reductions in consumption expenses also for the reduction in export spending by foreigners or government spending. In no case are any funds freed up to magically finance higher investment by the corporate sector. To the contrary, a decrease in expenses for goods and services that are produced by the corporate sector means that the sector sees its profits fall.

Earlier, we had assumed that the household sector wanted to decrease its consumption after reading the neoclassical authors cited above. But the more realistic case is that they decrease their consumption spending if they feel less secure about the future (precautionary saving); if they have to save more because the PAYGO pension system has been dismantled so that they have to save in the

form of a funded pension system and/or if they had financed their consumption by credit and suddenly find that they have to decrease their debts relative to income, i.e. to deleverage.

The latter can be the case after a credit and consumption (or investment) boom. In that case, economic units that have taken on too much debt reduce that debt and do mostly so by reducing their expenses. Remember that to reduce net debts, one has to increase financial saving. The government could increase its own expenses (more government spending) or decrease its revenues (lower taxation) to maintain aggregate revenues and ease other sectors' deleveraging. However, if the government tries to reduce deficits in the context of a generalised deleveraging, this will again lead to the paradox of thrift in which the attempt by all sectors to simultaneously increase their financial net worth will necessarily lead to a decrease in aggregate revenues and expenses, necessarily thwarting those plans.

To sum up, the loanable funds theory is based on the confusion of quite different economic phenomena, which leads it to propose policies that are positively harmful for the economy. A clearer view of the different economic phenomena by taking accounting rules more seriously would very likely lead to an improvement of the "dismal science".

4) Conclusion

This paper has argued that it is necessary to have a clear understanding of different economic concepts if one does not want to find oneself in a "problem entanglement" in which different things are equated with each other that are in reality quite different. Thus, it has been shown that financial saving and non-financial saving and the lending and borrowing of means of payment are quite different things that have to be clearly distinguished. The neoclassical theory has confused all those concepts and found itself in a muddle from which it is hard to escape. The loanable funds theory is a prime example of those muddles.

Once one clearly recognises the difference between real productive capital (non-financial assets) and money, it is only a small step to a clearer understanding of real world economic phenomena. This has been an important research project since Wicksell's book "Interest and Prices" (1936). Keynes' General Theory (1936/1997) has only been one mark in this intellectual history. However, neoclassical economics, in which all economic phenomena are deduced from a production economy with full employment is still en vogue in the 21st century.

Appendix

ABBREVIATIONS

a: assets

c: consumption

cg: complementary group

D: debt

e: expenses

EX: exports

fa: financial assets

fnw: financial net worth

g: government expenditure

g: group

i: investment

IM: imports

L: labour

l: liabilities

m: means of payment

nfa: non-financial assets

nw: net worth

ofa: other financial assets

r: revenues

s: saving

T: taxes

w: wages

y: income

Π : profits

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