

A New Approach to Macroeconomics

Author: Chris Rimmer

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Introduction

This document is an outline of a seemingly completely new macroeconomic model and foundational theory, which I believe shows up errors in a number of other economic theories. It concentrates on those aspects of the economy which are independent of human preferences and behaviours, producing interesting results in which we can have confidence irrespective of the decisions of the participants in the economy.

In this model, debt plays a primary role, which is vital for any theory which wants to describe financial crises. I hope that this model becomes widely adopted, since I believe that it reveals a number of policy errors which have been made in recent years. I am convinced these are causing, and will cause, extreme hardship, and must not be repeated. The document also shows the dangers of alternative approaches, such as Modern Monetary Theory's recommendations.

Summary

- Balance sheets make an excellent macroeconomic model
- Net worth is crucial to understanding economics, and a variant of Say's Law applies
- The effects of economic activity at the macroeconomic scale are simply the sum of the effects at the individual scale
- The model is highly intuitive: it can be represented pictorially
- The model quickly and easily identifies errors in other theories of economics
- There ain't no such thing as a free lunch

The Model

The model has two aspects: static and dynamic.

The static part consists of the balance sheets of all people in the economy. In this document, *person* refers to either a natural person or a corporation (including banks, governments, charitable organisations, etc.).

The dynamic part looks at the changes to these balance sheets over time.

Balance Sheets and Net Worth

Every person has:

- a collection of tangible things which they own: a house, a car, a wristwatch, etc.,
- a collection of things which they are owed, and
- a collection of things which they owe.

In principle we could make a list of all these things for each person in the economy.

The first two types of thing together are the person's *assets*, and the third type are the person's *liabilities*. They can be shown on a balance sheet for this person:

Balance Sheet for a person

Assets	Liabilities
House	Car dealer: £18,000 (car loan)
Car	Neighbour: Bag of sugar
Wristwatch	
Building society: £5,000 (savings account)	
	Net Worth = House + Car + Wristwatch – £13,000 – Bag of sugar
Total: House + Car + Wristwatch + £5,000	Total: House + Car + Wristwatch + £5,000

This simply lists all of the person's assets on one side, and all of the person's liabilities on the other. ***Total assets minus total liabilities is known as net worth:*** it shows what the person would be left with if everyone paid all of their debts, and is a good measure of the person's wealth. By convention, it is shown on the liabilities side of the balance sheet, to make the total of both sides equal. I argue that net worth is a fundamental, and sadly neglected, concept in economics.

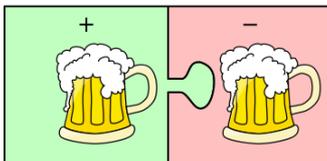
Balance sheets usually show an *estimated* money value for each asset and liability, but this is not necessary, and can be misleading. In fact, the failure to distinguish between an *actual* asset and the money for which it can be bought can easily lead to confusion and invalid conclusions.

The only complication of using *actual* assets and liabilities is that the net worth cannot be simplified to a single number; it must be left as the difference between a sum of heterogeneous assets and a sum of heterogeneous liabilities, although it can be partially simplified where a person owns some of the things which they owe. For example, a person who *owns* a house and two bags of sugar, and *owes* one bag of sugar to a neighbour, has a net worth of a house and *one* bag of sugar.

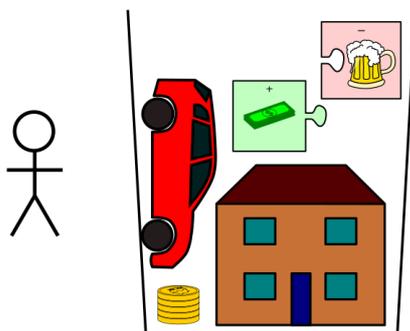
When someone already owns everything which they owe, their net worth can be simplified to just a sum of assets. If they owe things which they do not currently own, their net worth cannot be simplified in this way until they have acquired what they actually owe – through production, trade or some other means.

Visualising Balance Sheets

We can visualise a person's balance sheet as a bucket containing all of the things which they own, as well as tokens representing what they owe and what they are owed. Debts always consist of two tokens – one for the debtor and one for the creditor. They can be represented as a pair of jigsaw pieces – for example these two pieces represents a debt of a pint of beer:



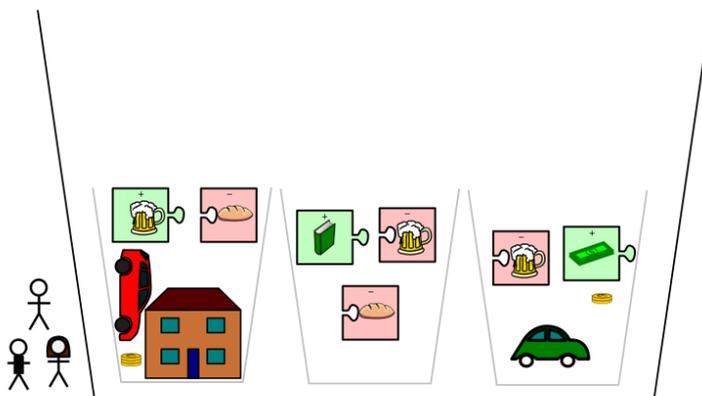
And here is a representation of the balance sheet of a person who owns a house, a car and 5 gold coins, is owed \$100, and owes a pint of beer:



Balance Sheet Aggregation

It is possible to create a balance sheet for a group of people, illustrated by putting all of their individual buckets into a bigger bucket. It can easily be shown that:

The net worth of a group of people is the sum of the net worths of the individuals in the group.



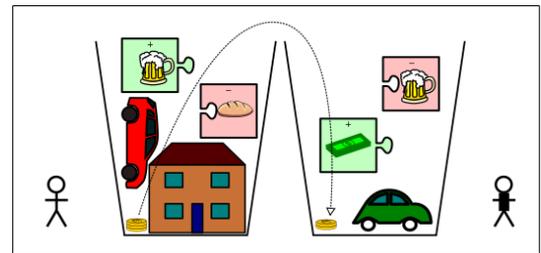
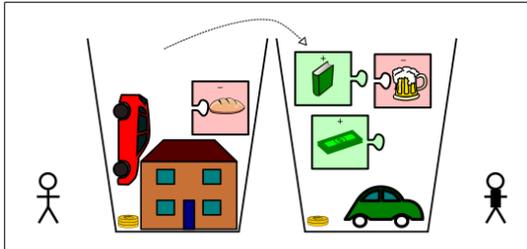
By aggregating the balance sheets of everyone in a closed economy, and remembering that every debt owed to one person is matched by a debt owed by another person, it is clear that:

The aggregate net worth of all people in the economy is the total of owned assets, (which is also the total of everything previously produced and not yet consumed).

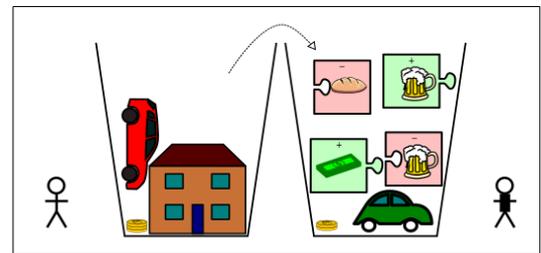
Balance Sheet Changes

There are just seven atomic actions which cause balance sheets to change:

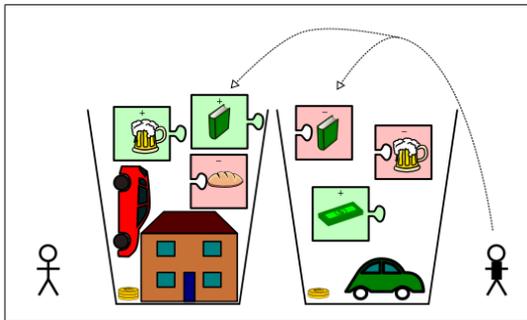
1. **Transfer owned asset.** The asset is moved from one person's balance sheet (bucket) to another.



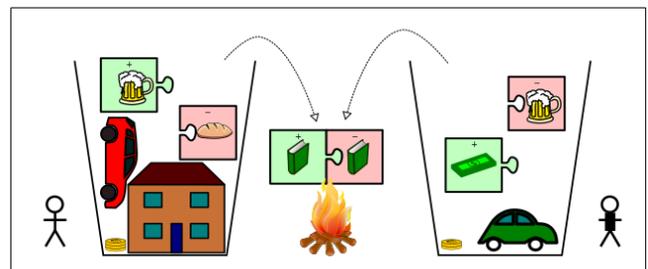
2. **Transfer debt asset.** The debt is now owed to another person instead.



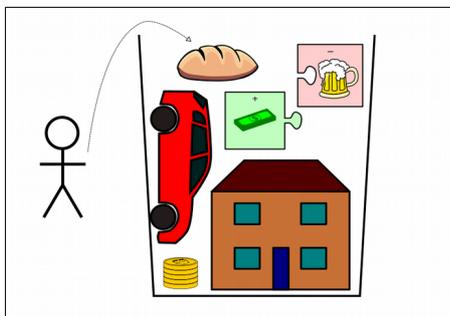
3. **Transfer liability.** The debt is now owed by another person.



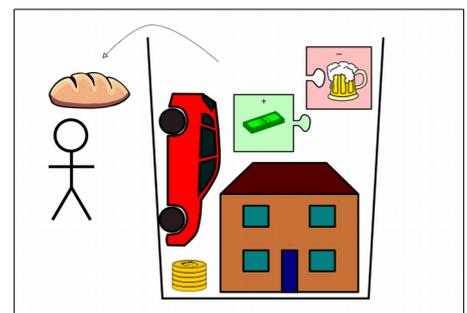
4. **Create debt.** One person now owes something which nobody owed before, and another person is owed the same thing which they were not owed before.



5. **Write off debt.** One person who owed something no longer owes it, and the person to whom it was owed is no longer owed it.



6. **Produce.** A new asset is created.



7. **Consume.** An existing asset is destroyed.

Of these atomic actions, *all but 6 and 7 leave the combined net worth unchanged*. Production adds the newly produced asset to overall net worth, and consumption subtracts the consumed asset from overall net worth.

In the absence of production and consumption, economics is a zero-sum game.

Debt is also zero-sum. Total debt assets always equal total liabilities.

Typically, these actions are part of a larger transaction e.g. a shopper buying a saucepan with a debit card involves actions 1 (transfer of the pan from the shop to the shopper) and 2 (a debt owed by a bank to the shopper is transferred to the shop).

Note that the effect of composing any number of these actions into a larger transaction or group of transactions is simply the sum of the effects of the individual actions. This makes macroeconomic analysis of individual transactions not only possible, but actually simple.

Modelling Services

A service is where a provider performs some act which benefits a recipient, but no goods are transferred. The benefit comes from the act itself, rather than the ownership or consumption of a good. Examples include gardening work, cutting hair, an artistic performance, and providing rented accommodation.

We can treat services as being the simultaneous production, transfer (if the provider and recipient are different people), and consumption of an imaginary good. This is useful, as it reduces the amount of text required to discuss economic transactions.

Demand and “Say’s Law”

“Say’s Law” has been expressed in different ways by different authors. Say himself argued that products (goods and services) are effectively bought with other products, and that money is just a temporary intermediary. Keynes interpreted it as “supply creates its own demand”, and disagreed with it.

This section will examine what can be said with certainty, being careful to remember that:

1. Some goods bought in markets are subsequently resold,
2. Some production is never sold,
3. People can give away something valuable without receiving anything valuable in return.

It is possible to create a simple counter-example to both Say’s and Keynes’s interpretations:

In October, Adam has a bag of 10 apples which he has harvested, and Bella has £5. Bella buys Adam’s apples at the market for £5, and she eats them over the following two weeks. In December, Adam gives Bella £5 as a (very unimaginative) Christmas present.

When the money returned to its starting position, all that had happened was that Adam owned 10 fewer apples, and Bella had benefited from consuming 10 apples. The apples were certainly bought – they were exchanged for money at a market, but they were not bought with another product. (Say’s claim can only be salvaged by saying that the apples were bought with themselves).

The same example counters Keynes's interpretation, because the supply of the apples (when Adam brought them to market in January) did not lead to an increased demand for other products, since nobody had any extra means of buying products as a result of the complete scenario.

However, using net worth, it is possible to salvage something very valuable from "Say's Law" by being more careful about what we state, and by not assuming that all economic activity takes place in markets between producer-suppliers and demander-consumers. But first we must understand the meaning of *buying* a product, and look at the meaning of *final demand*.

The essence of buying a product, as opposed to being given or seizing it, is that the buyer not only receives the product, but gives something of value in return, which buyer and seller consider a fair exchange. This could be another product, but it could instead be a new debt from the buyer to the seller, the transfer of a debt asset owed by a third party, the agreement of the buyer to assume a liability of the seller, or the write-off of a debt from the seller to the buyer. In essence:

Buying a product means that the buyer obtains it by transferring a mutually acceptable amount of their net worth in exchange

Increasing Final Demand

Final demand is demand for products which the buyer will consume, whether quickly (such as an ice cream on a hot, sunny day), slowly (such as a domestic vacuum cleaner, or manufacturing machinery), or very slowly (such as a house or a factory).

Buying a product for consumption, then, reduces the net worth of the buyer *ceteris paribus* by the amount paid, reducing their ability to buy other products. This naturally leads to the question of whether it is possible for final demand to be increased across the whole economy.

We have already seen that the combined net worth of everyone in the whole economy is equal to everything which has been produced and not yet consumed. In fact, we could very reasonably call this *aggregate savings*. If the rate of production is greater than the rate of consumption, aggregate savings is increasing, and if the rate of production is less than the rate of consumption, aggregate savings is decreasing.

If final demand increases, consumption also increases, and there are only three possible outcomes:

1. Aggregate savings increases at a slower rate, so less is available in the future for periods of net consumption than there would have been otherwise.
2. Aggregate savings reduces at a faster rate, increasing the rate of reduction in the standard of living as capital is consumed quicker, and bringing forward the time when there are no more savings, and when consumption must suddenly be reduced to no more than the actual level of production.
3. The rate of production increases to compensate for the extra consumption.

In the long run, there is no way around the fact that consumption can only be enabled by production. While one group of people can consume more than they have produced, they can only do this by consuming the savings of other people, either by the wealth being transferred, or by the

net consumers becoming indebted to the net producers, and then having to produce more than they consume in future in order to repay the debts.

The concept of aggregate savings appears to demonstrate conclusively that a policy of promoting consumption is the path to ruin rather than prosperity.

Instead of Say's dubious "products are bought with products", we can express a similar sentiment but with accuracy as:

Products can only be consumed if those products were produced either previously or concurrently.

Insolvency

When a person does not have enough assets to settle all of their liabilities, they are *insolvent*, and as things stand, the creditors will not all be paid in full. The situation may lie dormant for an extremely long time, particularly if creditors have a false confidence, but eventually the situation will be revealed, at which point some of the debts will have to be written off, revealing that the creditors in reality had a lower net worth than they believed.

This topic cannot be fully covered in this introduction, although it is straightforward to model. It is a very important topic, as it is at the centre of many financial frauds. For example, a Ponzi scheme takes money from investors and promises to pay back more money in future. An honest investment can only do this if it buys assets which increase in value over time (due, ultimately, to someone producing more than they consume in the process). However, a Ponzi scheme uses the money from investors to pay returns on previous investors' savings. The scheme's liabilities to the investors do not reduce, but its assets are transferred to investors (as fake returns), so it almost instantly becomes insolvent. The scheme's balance sheet is typically falsified to show assets which do not really exist, giving investors the impression that the scheme is solvent. The fraud only becomes apparent when enough investors demand that their debts be paid, and the scheme is unable to pay because it does not have any real assets to sell in order to pay the investors.

The Advantage of Balance Sheets as a Macroeconomic Model

Because both aggregation of balance sheets and composition of atomic actions are *linear* operations (i.e. the whole consists of the sum of the parts), this model neatly links the macroeconomy to individual microeconomic changes. We can obtain useful results without attempting to model value, prices, and human behaviour.

We are left with a simple, intuitive view of the economy as involving production, consumption and trading of net worth. The trading part (typically involving paying for goods and services with money, which is just a debt from a bank to the holder) is much less relevant than production and consumption themselves.

The balance sheet model implies that the emphasis of traditional economics on exchange is misplaced. While exchange may provide an increase to each party's satisfaction with what they have, it does not affect their combined net worth. It is *production* which adds to the stock of things available to consume.

There are certainly extremely important questions which the balance sheet approach cannot possibly address, such as a theory of how the price of one asset or liability is measured in terms of another. However, the balance sheet model is an extremely useful tool for assessing macroeconomic theories, which may have made subtly invalid assumptions, because it focuses on statements which remain true irrespective of prices and people's valuations and decisions.

Some Results of the Balance Sheet Model

Bastiat's Broken Window Parable

When a hooligan breaks a baker's window, some economists say that this adds to the nation's prosperity because it boosts demand and therefore production: the baker buys a window from the glazier, who now has money to buy a new pair of shoes, etc.

The Balance Sheet Analysis

When the baker's window is broken, his net worth decreases by one window. Everyone else's net worth is unchanged. The world as a whole is worse off by one window. QED.

Furthermore, when the baker exchanges some of his savings for a window from the glazier, the glazier has more money, but he also has one less window to sell to another customer. By the time that the shoemaker (who sold shoes to the glazier) has bought a birthday cake from the baker, the total change to everyone's net worth *subsequent to the consumption of the original window* is:

Baker: + 1 window - 1 cake

Glazier: + 1 pair of shoes - 1 window

Shoemaker: + 1 cake - 1 pair of shoes

These exchanges could have occurred anyway, perhaps with different customers. Each party only obtains what they want by giving away something which the other party considers to be of at least equal value. None of them has benefited from the original destruction of the window.

One further insight into the fallacy, which a balance sheet analysis suggests, is gained by asking what would happen if the hooligan broke the *glazier's* shop window.

Quantitative Easing

QE involves the central bank buying financial assets with new money, perhaps to lower interest rates or to increase the money in circulation, and therefore increase investment or demand, or some such argument, supposedly to boost the economy and make everyone more prosperous.

Balance Sheet Analysis

There are two actions involved:

- The transfer of a debt asset from one person to the central bank, and
- The creation of a new debt from the central bank to that person.

The effect of each of these actions, as always, has no effect on the combined net worth of the two parties. Therefore if quantitative easing ultimately increases one group of people's net worth, it must also reduce the net worth of everyone else by an equal amount.

The Natural Rate of Interest

Mervyn King, former governor of the Bank of England, claimed that the natural rate of interest is that which creates enough demand to produce full employment.

Balance Sheet Analysis

When a bank makes a loan, there are usually five actions involved, two of equal value at the start, one in the middle, and two of equal value at the end:

- A new debt from the borrower to the bank (promissory note)
- A new debt from the bank to the borrower (a new deposit)
- A transfer of money (a debt asset) as interest from the borrower to the bank
- A write-off of the debt from the borrower to the bank (when the loan is repaid)
- A write-off of the debt from the bank to the borrower (in recognition of repayment)

However, sometimes a borrower will default (i.e. the bank must write off the debt owed by the borrower, but the debt owed by the bank remains). If so, the bank's net worth decreases by the amount defaulted. Therefore, for the bank to remain solvent in the long run, the interest charged on each loan must be enough to cover:

- the expected amount of default on that loan,
- a share of the cost of running the bank (including paying employees), and
- a share of a reasonable profit for the bank, so that its owners can make a living

The natural rate of interest is that which produces an income which equals the sum of these three expenditures of the bank.

Some Challenges to Other Economic Theories

Neo-Classical and Keynesian

In the circular flow of income analysis, both the Neo-Classical and Keynesian theories argue that the leakages from household savings reduce the spending in the economy, and that business investment is required to avoid depression. They only differ in whether this happens automatically through a market for loanable funds, or if state intervention is required.

Balance Sheet Analysis

A balance sheet analysis shows that both theories are modelling household saving incorrectly – as a *donation* from the saver to the bank. They also model investment as a *donation* from the bank to

the business. In reality, household saving of cash at a bank is an exchange: the saver gives to the commercial bank a debt asset owed by the central bank, and the commercial bank creates a new debt to the saver. The saver has just as much net worth as before, and in a later period of time is able to spend *more* than their income as a result. Similarly, a firm which has borrowed must later repay the loan, and therefore cannot return all of its income from households as wages, etc.

The saving leakage sets up a later withdrawal injection, and the investment injection sets up a later repayment leakage. In practice, there are some households withdrawing while others save, and there are some firms repaying debts while others receive new loans. There may be periods where the flow is more in one direction than the other, but the outstanding debts always enable cumulative injections and leakages to return to exactly zero.

Austrian

The Austrian Business Cycle Theory considers all business cycles to be caused as a result of credit creation. It claims that the creation of new money by banks inherently leads to an unsustainable situation in which there are more claims on goods and services than can be delivered, leading to a correction in a credit crunch.

Balance Sheet Analysis

From the balance sheet perspective, money is just a way to transfer net worth without concurrently having to sell illiquid assets. Anyone could offer their own IOU in exchange for goods and services, but these are not generally accepted in payment. Instead, someone who does not have money but does have enough net worth can write an IOU to a bank in exchange for the the bank's IOU to them. This bank's IOU is a deposit, a form of money which can then be spent with a cheque or credit card. The bank can generally settle this deposit debt because it is owed an equal amount by the borrower, and if the borrower defaults, the bank has capital to absorb a certain level of losses. The issuing of new credit is not itself the problem – it is only when the defaults on loans exceed the bank's capital that there is a problem, specifically the insolvency of the bank meaning that the bank does not have enough net worth to settle its debts to its depositors.

As long as borrowers use the money to buy something of equal or greater value, or they have enough net worth to cover any losses, there is simply no problem. A general fall in confidence only leads to a short recession in which it becomes clear that the debtors of outstanding IOUs do in fact have the ability to settle their debts, thereby restoring confidence.

On the other hand, the Austrian Business Cycle Theory does an excellent job of describing a financial crisis in which there is widespread insolvency due to malinvestment.

Modern Monetary Theory

MMT claims that prosperity can be obtained by the government issuing as much new money as it takes to be the employer of last resort, and that inflation need not occur because the government can tax away any excess money in the economy.

Balance Sheet Analysis

When someone is employed, *their work* generally adds to the employer's net worth by helping to produce more valuable goods and services than could be produced otherwise.

Even this is not always true – for example, they might require intensive supervision from someone who is a much more productive worker. It is even possible that an employee could *reduce* the employer's net worth through careless or deliberate damage to the employer's capital equipment.

However, there are also costs to the employer – the wages of the employee, resources the employee needs, taxes imposed on employers, etc. If, over a particular period of time, these costs are greater than the additional production gained, the effect will be a combination of:

- the price of the employer's goods or services will increase,
- the profit for the employer's owners will decrease, and/or
- the net worth of the employer will reduce, and eventually will make the employer insolvent, either pushing losses onto creditors, or causing the employer to cease operations.

This applies equally to a private and a government employer. If an employee is unable to produce more than the cost of employing them in the private sector, simply employing them in the public sector will not change this fact. Equivalently, if an employee is able to be a net producer in the public sector, it is also in the interest of a private employer to hire that person.

A society may decide that people who are unable to produce as much as they consume in the process should be subsidised to work, but the cost of this *must* come from others: the excess of one person's consumption over production *must* be compensated for by others' excess of production over consumption (or equivalently by the reduction in their stocks of saved production).

The issuing of new money does not affect this calculation in any way. Either government-issued money is a debt to the holder or it isn't. In the former case, it is an asset of the holder and a liability of the government, with the joint net worth unchanged.

In the latter case, as it is not a liability of the government, it cannot be an asset of the holder, since there is nobody who is required to provide goods and services in exchange for the money. Legal tender laws requiring people to accept the money in certain situations do not affect this conclusion either. Even though the holder can exchange the pure fiat currency for valuable goods and services, the group of *all* people as a whole cannot – they can only exchange it amongst themselves.