

# **A Kindergarten guide to modern monetary theory Days 1-4**

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# A Kindergarten guide to modern monetary theory

**Frank Ashe**

## **Abstract**

A short guide to modern monetary theory is given. The approach is kept as simple as possible to highlight the logical coherence of the system of fiat money and its differences from a gold-standard theory of money. The role of the government is central to this discussion. Many common ideas concerning money, which are holdovers from a gold standard, do not hold under a fiat system and this has implications for financial systems.

*Keywords: money, gold standard, credit, modern monetary theory, fiat money*

*When reading about modern monetary theory I suggest the following procedure:*

- *Forget who you are.*
- *Forget what you think of government – good or bad – unless you are going to be able to get rid of government (that is, establish pure communism) you are stuck with it.*
- *Forget what you think of social policy – you may hate the unemployed or you may feel compassion – forget all emotions.*
- *Forget what nation you live in – it doesn't matter.*
- *Forget all prior economic concepts and training (if any).*
- *Then just try to understand what you read.*

*Bill Mitchell<sup>1</sup>*

With a number of commentators coming up with contradictory views on how the world will come out of the GFC I was forced to wade into the morass of economic thought myself and see if there was anything that could be sensibly said.

The risk of the world ending up in unpalatable economic circumstances needs to be understood by any company in the finance industry, so what should a risk manager know? In terms of a standard risk management framework I was at stage one – identify the risks. Could I listen to the experts? No, they disagreed with each other. Could I get them to sit down and debate the matters sensibly? No, they talk past each other and don't listen. That in itself raises big risk management issues at a strategic level – we may or may not have a huge risk with no simple way of finding out. You have to assume the risk is there and plan accordingly. Separately, I chose to see if I could make sense of the arguments.

The following highly simplified account of fiat money and credit creation is my attempt to put one part of the economic theory, given the name of Modern Monetary Theory by its

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<sup>1</sup> Mitchell, B. (2009). "In the spirit of debate ... my reply Part 2." Retrieved 8 October 2009, 2009, from <http://bilbo.economicoutlook.net/blog/?p=5224>.

developers<sup>2</sup>, into plain talk. I have deliberately tried to dumb down the language as much as possible to ensure that anything that may be wrong will be glaringly obvious – it is far too easy to hide critical issues behind obfuscatory academic jargon<sup>3</sup>. This area of the theory of money is contentious, as all monetary theory seems to be. My particular interest in this particular theory is due to the very simple nature of its assumptions and the clarity of its logic – essentially looking at the consequences of a stock/flow consistent analysis of money and credit.

One important point that flows from this analysis is a recognition that most of the current discussion on the topic of money, credit, and the government sector finances has a language that comes from the gold standard era of money. Most economies have been in a fiat money system since the mid 1970s – it's time to move the discussion onto the proper footing.

As part of this, I've noticed it is easy to become confused between the boundary line demarcating (i) and (ii) and the boundary line demarcating (ii) and (iii) where:

- (i) what is easily accomplished using the current economic institutions, widely interpreted as: laws on budgetary outcomes; notional independence of central banks; presentation and discussion of government finances; imagined reactions of bond markets etc i.e. the self-imposed constraints under which a government manages the economy;
- (ii) what is actually happening under a fiat money system;
- (iii) what is not allowed under a fiat money system.

In discussion with various people I have found this confusion to be very difficult to overcome. The self-imposed constraints have so muddled the stream of discourse that it is difficult to see what is happening beneath the surface.

The following classroom discussion looks at the basic flows of a fiat money system. It does not consider the “Jobs Guarantee” component of MMT.

For those people who start to read this and feel their hackles rising, please read Bill Mitchell's quote above. If you don't like the conclusions then please point out the error in my assumptions or my logic. It is not sufficient to point to a conclusion and say that it's obviously wrong – from personal observation, the obviousness of the wrongness is driven by imagining the self-imposed constraint is actually a logical constraint, or by cognitive dissonance. As Keynes said<sup>4</sup> “Practical men, who believe themselves to be quite exempt from any intellectual influence, are usually the slaves of some defunct economist.”

No kangaroos are allowed – no jumping to conclusions that are not completely supported by the assumptions that have been made so far.

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<sup>2</sup> None of the ideas presented in the class discussion are my own. I am presenting others' ideas. The best introduction to the ideas is via an excellent series of articles on Bill Mitchell's blog at <http://bilbo.economicoutlook.net/blog>. Wray (1998) gives another exposition of the ideas.

<sup>3</sup> As an example, see Walsh, C. E. (2010). *Monetary Theory and Policy*. Cambridge, Massachusetts, The MIT Press., which has been cited (on the back cover) as the best, indeed only worthwhile, textbook on the subject.

<sup>4</sup> Keynes, J. M. (1936). *The General Theory of Employment, Interest and Money*. Cambridge, Macmillan, Cambridge University Press., Ch24.

**Everything I know about economics should have been taught at kindergarten!**

Miss Moneypenny is a kindergarten teacher with a very bright set of pupils:

- Neo, a bright boy who loves playing with models and watches lots of science fiction and fantasy movies peopled with supercomputers capable of fantastic computations, beings who can see all possible outcomes of theirs and others actions, and humans without emotions clouding their thinking;
- May, a clever girl who prides herself on changing her opinion when the facts change;
- Karl, always thinking about the underdog;
- Frank is a risk manager at a complex, diversified financial services company who has crept into the class because he can't understand what's happening in the GFC. He has a PhD in thinkology but still gets confused when academic economists throw big words at him <sup>5</sup>.

<i>Class</i>	Miss, where does money come from?	
<i>Moneypenny</i>	That's a long story. We'll have to talk about people and groups of people and trusting each other.	
	<b>The major players</b>	
	Here are the Australian people	
	Here is their Government.	
	The people tell the government what to do. This is democracy. We'll ignore this for the moment and pretend the Government is not listening to the people.	

<sup>5</sup> For example: “non-superneutrality of money”, “non-separable preferences”, “the Taylor principle is based on the mapping from policy response coefficients to eigenvalues in the state space representation of the model”. These come from Walsh (2010), a book described by the Chief of Economic Research at the Central Bank of Chile, as “a pleasure to read”.

	Here is the rest of the world – we’ll ignore them for the moment <sup>6</sup> .	
	The government can do things that ordinary people aren’t allowed to, like make laws. This is one reason the people invented government.	
	For understanding money we need to just remember that we can’t assume that the government has to follow the same rules as people – it’s a different sort of entity <sup>7</sup> .	
	<b><i>The Real Economy – Part 1</i></b>	
<i>Money penny</i>	People have a habit of acquiring and disposing of things. These trades are called the economy.	
<i>Neo</i>	<i>What about making things? Isn’t that important?</i>	
<i>Money penny</i>	We’ll only look at what people swap between themselves. If you make something for yourself then it’s your own business. The <i>economy</i> is what everybody does for other people.	
<i>Class</i>	<i>What is the size of the economy?</i>	
<i>Money penny</i>	The economy is big. If we add up all the cash and credit that people use to buy things in a year then that is one way to guess the size of the economy in that year <sup>8</sup> . But first I need to tell you what cash and credit are.	

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<sup>6</sup> There is no significant change to the arguments when we consider the rest of the world. The class asks so many questions later that Miss Money penny does end up discussing what happens with the rest of the world on Day 4 and later.

<sup>7</sup> Remember the *Fallacy of Composition*. The properties of an aggregate entity may not be deducible from the properties of its constituents. The most well known examples in economics are most probably the *Paradox of Thrift* and the *Tragedy of the Commons*.

<sup>8</sup> If we want to look at what the people in the economy make in a year then that is a much more difficult question as most things that people make are not sold, and so we don’t have a simple way of adding them up. Economists try to add up the value of things that are bought and sold (in jargon this is PQ where P is the typical price and Q is the quantity of things sold), and then try to avoid double counting. This gives them GNP or GDP.

	<b>Cash</b>	
	This is physical money. Some people call it <i>cash</i> .	
	Often people put a price on the things they want to get, or get rid of. <sup>9</sup>	
	People can swap physical money for things – the price is how much physical money to swap. This is called buying and selling.	
	If people don't have physical money then they can trust each other to pay later.	
<i>Karl</i>	<i>What if you have nothing to get rid of? How do you get cash or credit?</i>	
<i>Moneypenny</i>	Oh Karl! You always have your free time, or time that you're spending doing something you don't like. You might get someone to buy your time to pick up some rubbish. Then you can use the cash to buy the time of someone to tidy your room. If you like tidying your room less than picking up rubbish then you're ahead!	
	<b>Credit</b>	
	If I promise to pay you cash for something you've given me then I have a <i>financial liability</i> and you have a <i>financial asset</i> .	
	No net financial assets or liabilities have been created <sup>10</sup> .	My liability of \$100 = Your asset of \$100
	This is called <i>credit creation</i> and it creates <i>credit</i> .	Gross credit is increased by \$100
<i>May</i>	<i>What happens if you lose an IOU?</i>	
<i>MP</i>	You lose a financial asset and the person who owed you the money no longer has the liability. Everything still balances.	

<sup>9</sup> "Things" include services and intangibles.

<sup>10</sup> Notice that there is no net saving being done. Every asset has a corresponding liability.

	Sometimes people trust each other a lot. The amount of credit goes up because we're quite happy doing things for people and trust we'll be paid later.	
	Sometimes people don't trust each other much. The amount of credit goes down. We give people back their IOUs and ask for the money.	
	People lose trust if they think the other person's promises to pay won't be kept.	
<i>Neo</i>	<i>What will stop the amount of credit just going up and up and up?</i>	
<i>Money penny</i>	That's a difficult question that we'll come to later. But simply, if we all trust each other enough then there is nothing to stop the amount of credit growing bigger and bigger and bigger, just like blowing a bubble <sup>11</sup> .	
<i>Neo</i>	<i>That's silly, Miss. People could see what's happening and they'd stop trusting each other.</i>	
<i>Money penny</i>	It would be nice to think so, but it doesn't happen.	
	<b>Financial Instruments</b>	
	One person can promise another to pay them $\$(1+i)$ in the future. This is a <i>financial instrument</i> . The price of this instrument now is \$1. A simple name for this is a <i>bill</i> .	
	The number $i$ is the amount of interest paid. Some people call $i$ a rate of interest <sup>12</sup> .	
	If I sell you a bill then I have a <i>financial liability</i> and you have a <i>financial asset</i> .	
<i>May</i>	<i>So if I wanted to spend cash so I could run a shop, then I could sell you a bill and get the cash?</i>	

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<sup>11</sup> For anybody who thinks that a bank's credit creation may be constrained by its capital, or regulators, or shareholders, or the market, or its Board, or its risk managers, may I ask you to consider UBS in the period to 2008 - UBS (2008). Shareholder Report on UBS's Write-Downs, UBS AG: 50.. UBS's balance sheet kept expanding through their buying (or creating) CDOs funded at a positive spread (not risk adjusted) to the cost of UBS borrowing money. While there were enough people capable of imagining that the CDOs were risk-free there was no constraint on their balance sheet. This stopped when their CDOs lost so much money that these instruments could no longer be imagined to be risk-free.

<sup>12</sup> Rates of interest usually make discussing rates of return easier. However as anybody who has tried to figure the rate of return for a highly structured cash flow has found, there may not be a simple number for the return that satisfies our conceptually clean idea of a return for a bill. Money penny leaves interest rates out of her discussion for the very good reason that they may be confusing.

<i>Money penny</i>	That's right, May. I wouldn't even need to have the cash. If other people trusted my credit then I could just give my bills to you and you use them to buy what you needed.	
<i>Neo</i>	<i>Wow! We've talked about credit creation and we haven't mentioned banks!</i>	
<i>Money penny</i>	Banks are special, but not as special as some people think they are.	
<i>May</i>	<i>Is this credit really what we call <b>money</b>?</i>	
<i>Money penny</i>	Some people would say so <sup>13</sup> , but it's confusing if we do while we have this conversation. We'll try not to call it money, it's credit. Of course you can buy things with this credit, which is why people loosely call it money. If we call this idea <i>money creation</i> then some people get even more confused, so we won't!	
	<b>The Payment System</b>	
	Here is an ordinary bank. To keep things simple we will sometimes treat banks like people, but it's silly to think like that all the time.	
	People trust banks a lot <sup>14</sup>	
	If lots of credit has been created people can lose track of who owes whom how much.	
	Banks have created a payment system to help solve this problem. This is a service that banks sell to people.	
	Banks set up accounts for people where the people can keep track of all the credit they've created or been given.	
	Most people have bank accounts.	
	The account is a number in a ledger.	

<sup>13</sup> See Committee on Payment and Settlement Systems (2003). The role of central bank money in payment systems. CPSS. Basel, BIS. as an example of a document that calls this *commercial bank money* as distinct from *central bank money*. The exchange rate between the two is one-for-one.

<sup>14</sup> Usually!

	If I give the bank \$10 of physical money they increase my account by \$10.	Bank liability = \$10 owed to me Bank asset = \$10 cash
	If I take \$10 of physical money then they decrease my account by \$10.	
	The bank's balance sheet is always balanced	
	A positive amount in my account is a financial asset for me and a financial liability for the bank.	
	If Adam and Betty have accounts with the same bank and Adam owes Betty \$10 then Adam can tell the bank to decrease his number by 10 and to increase Betty's by 10. After this Adam doesn't owe Betty anything.	
	If Adam and Betty have accounts with different banks then Adam's bank will decrease Adam's account by \$10 and pay \$10 to Betty's bank, which will increase Betty's account by \$10. This is an <i>interbank transfer</i> .	
	To make sure that the transfers can occur the banks may keep some physical money on hand. This is called <i>liquidity</i> .	
	But there are other ways that banks can transfer money! We need to know a little bit more about banks first.	
	<b><i>The Banking System</i></b>	
	Banks trust some people	
	Banks like buying bills from people they trust. This is called bank lending. Banks like charging a large amount of interest.	
	Banks don't have enough physical money for all their lending and so they create credit <sup>15</sup> . The number in the borrower's account goes up when the bank buys a bill (makes a loan <sup>16</sup> ).	Liability = \$100 in borrower's account Asset = \$100 PV of bill

<sup>15</sup> The technical term is *fractional reserve banking*.

<sup>16</sup> Note that Miss Money Penny is trying to keep the idea of credit distinct from the idea of physical money - cash. Talking about "money" without a precise definition of what you mean can easily confuse things. Because of this possible confusion she is precisely saying what she means without using loose terminology. This avoids the trap that some people (Austrians are particularly prone for some reason) fall into when they talk about money. They use a loose term and then try to measure it in some fashion. Money Penny follows Humpty Dumpty's orthopraxis - "When I use a word," Humpty Dumpty said, in a rather a scornful tone, "it means just what I choose it to mean—neither more nor less." Carroll, L. (1871). *Through the Looking-Glass, and What Alice Found There* Macmillan.

	Everybody likes balance sheets to balance, so we are happy.	
May	<i>Let's pretend Bank A is creating lots of credit. What will happen?</i>	
	Adam has borrowed from <b>A</b> so he can spend and now he owes money to Betty who banks with <b>B</b> . Through the payment system, <b>A</b> now has to pay <b>B</b> some physical money but can't do it, so must borrow credit from <b>B</b> or from someone who can transfer credit to <b>B</b> . This is the <i>interbank money market</i> .	Liabilities: \$50 in Adam account \$50 IB borrowing Asset: \$100 PV of bill
	If <b>A</b> does this borrowing too often then other banks will start to demand a larger and larger amount of interest because they will lose trust in <b>A</b> . <sup>17</sup>	
	A simple way <sup>18</sup> for <b>A</b> to manage this risk is to have half of its liabilities created by people who will be taking money out of the bank, and half from people who will be putting money into the bank. <sup>19</sup>	
	To make sure people will put money into their accounts in <b>A</b> , it must pay enough interest.	
	Frank has to unlearn. He was taught that banks recycle savings. Now he sees that bank lending occurs first and then the bank may need to ensure that the savings and deposits stay with it to balance its lending.	

<sup>17</sup> In an extreme case we may find that no bank will be willing to lend to **A**, in which case the CB will have to lend to **A** as a lender of last resort

<sup>18</sup> Of course banks will also need to ensure there is some matching of the duration of the assets and liabilities, something that is beyond this class at the moment, but may be reached at a later day.

<sup>19</sup> This observation allows us to make some amusing corollaries. Borrowers create an asset for a bank but also a liability, being a bank account from which they will be drawing money. Depositors for the bank will be putting money into their accounts, which are also liabilities. So a bank needs to ensure that the liabilities created by its lending are, to some extent, cash flow matched with the liabilities created by its depositors and its borrowing. So asset-liability management can actually be thought of as only liability management!

<i>Neo</i>	<i>How do we know the savings will occur?</i>	
	The interbank transfer earlier only occurred when Betty had an increase in her account as Adam spent his credit. If Adam hadn't spent his credit there would have been no problem. If Adam spent his credit with Cathy who banked with <b>A</b> then there wouldn't have been any problem either – the credit would have remained on <b>A</b> 's balance sheet.	
	Lending creates the savings to support it. Frank has to unlearn more <sup>20</sup> .  All that stuff about IS-LM curves and pools of loanable funds, which he can't remember much anyway, is meaningless. Banks can lend as much or as little as they like <sup>21</sup> .	
	If Betty demands that Adam pay her with cash then Adam has to ask bank <b>A</b> for the cash first. This will come out of bank <b>A</b> 's liquidity.	
	Betty doesn't have to put her cash into a bank account, she can just keep it. Bank <b>A</b> has used its liquidity to finance the loan to Adam.	
<i>Karl</i>	<i>Where did this liquidity come from?</i>	
	Other people must have given cash to <b>A</b> before Adam asked for it.	
<i>Karl</i>	<i>What if <b>A</b> doesn't have enough cash?</i>	
	Bank <b>A</b> will have to use credit to buy cash from some other bank.	
<i>Karl</i>	<i>What if no other bank has enough cash?</i>	
	Bank <b>A</b> will have to tell Adam that it can't give him cash. Adam will have to tell Betty that he can't give her cash and must use credit.	
	If everybody wants to use cash and there isn't enough cash then people won't be able to do as much buying and selling. This means the economy won't grow and may even become smaller.	
	If I didn't trust the bank and my account was positive then I would demand physical money.	

<sup>20</sup> Frank is grateful he only did one economics course. That limits the amount he has to unlearn!

<sup>21</sup> A lot of people get confused because in the early days of the banking system the banks needed to have the deposits before they could lend. This is still the way that banking is taught in many places. But if we want to understand the current system we should examine what is happening now, not how it worked in the past.

	If everybody did this then the banks would be in big trouble because the amount of credit is usually much bigger than the amount of physical money <sup>22</sup> .	
	<b><i>Fiat money</i></b>	
	Only the Government can make money.	
	There are two ways the Government can make money.	
	Firstly, the Government can make physical money	
	If any of the people try to make cash then the Government locks them in jail. Jailing is another thing the government can do that individual people can't do.	
	The government puts cash into the economy by giving it to people or buying things from them.	
	Here is the Central Bank <sup>23</sup> .	
	The Central Bank is owned by the Government.	
	The CB thinks it is independent, but it will always do what the government says to, if the government really wants it.	
	Ordinary banks are owned by the people	
	Ordinary banks have an account with the Central Bank	
	This is called an Exchange Settlement account.	

<sup>22</sup> For an account of fractional reserve banking see Wikipedia or any basic economics textbook. At the level of discussion we've reached at this point there is no concept of a bank receiving deposits and then lending out a fraction of those - banks lend first and then get deposits.

<sup>23</sup> I'm conflating the role of Treasury and central bank here, but as both are arms of government I'm not losing anything. I'm assuming that the government knows what it's doing and is coordinated. Please feel free to make your usual jokes at this point. At a practical level the Treasury and Central Banks do coordinate the nitty gritty details of money extremely well.

Separate Central Banks and Treasuries are two of the institutions that are set up manage the economy. For discussion of the actual flows of money within and between the private and public sectors of the economy we don't need to distinguish them.

	All these accounts are just a number in a ledger	
	The number for a bank has to be bigger than 0.	
	If a bank gives the CB cash then the ES account goes up, if the bank takes cash from the CB their account goes down.	
	If bank <b>A</b> wants to transfer credit to bank <b>B</b> then it can ask the CB to transfer credit from <b>A</b> 's account to <b>B</b> 's. This means <b>A</b> and <b>B</b> don't need to keep as much cash as liquidity.	
	If a bank receives net credit transfers from other banks then its ES account goes up; if it pays net credit transfers then its ES account goes down.	
	<b>The government account</b>	
	The government has an account at the Central Bank.	
	The government can make money by telling the CB to transfer money out of its account to a bank's ESA.	
	There is no limit to how much the government can transfer from its account.	\$1,000,000,000,000 = One trillion dollars is only 13 keystrokes.
	The government account has no limits – it can be as big or small as it likes <sup>24</sup> .	
	Only the government is allowed to do this.	
	When the government account goes down and the ES balances go up some people call this <i>printing money</i> . This is just meaningless loose talk.	
	Physical money and ES balances are called <i>high powered money (HPM)</i> or <i>central bank money</i> <sup>25</sup> . We will just call this <i>money</i> .	
	This transfer from the government account is the <b>second</b> way in which the government makes money.	

<sup>24</sup> Yes, there are institutional arrangements that make this more difficult for a government. But remember that the institutional arrangements are self-imposed, not a logical necessity.

<sup>25</sup> There are various other names as well.

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	This ends this lesson.	
<i>Class</i>	<i>But this sounds like cheating. There must be lots of things that can go wrong if the government can just make more and more money.</i>	
<i>Neo</i>	<i>Yeah, my Uncle Milt tells me that all the time.</i>	
<i>MP</i>	May be, but that is a separate question and we'll have to consider it at another time. The question you asked was where did money come from – that's what I answered.  Now let's do astronomy. I want you to draw a black hole ...	

## Day 2

The next day the class presses Miss Moneypenny for more information on basic monetary theory.

	<b>Government spending</b>	
<i>Class</i>	<i>Miss, what happens if the government just makes lots and lots of money? Won't prices just go up and up?</i>	
<i>Moneypenny</i>	The Government can buy and sell things.	
	When the Government buys things from a person <b>P</b> it can give them cash or transfer credit from the Government's account to their bank account.	Govt acct down \$100 ESA up \$100 then P's acct up \$100
	The bank has no increase in net assets but <b>P</b> does. This balances the liability in the government account <sup>26</sup> .	Govt liability \$100 Bank asset (ESA) \$100, Bank liability (to P) \$100 P's asset \$100
	When the Government sells things it demands that it be paid in cash or as a transfer of credit from a bank that has an ES <sup>27</sup> .	
	If the government wants to help somebody <sup>28</sup> then it can just give them money (cash or a transfer from the government account).	
	If the government gives money to Adam then the CB decreases the government account, increases the ES account for Adam's bank, and the bank increases Adam's account.	
	When the government spends money the ESA for a bank increases.	
	When the government extracts taxes or fees then the banks' ESAs go down.	
	If the government wants to give the CB an asset in exchange for creation of HPM then it can sell the CB a bill or a <b>bond</b> . This creates a liability for the government and an asset for the CB.	

<sup>26</sup> Something huge just happened here, which the class will get to later. For the impatient people who can't wait, what we've just seen is that the private sector (i.e. people) just got some net financial assets. The private sector didn't have this before, net financial assets were zero. The only way the private sector can have net savings is if the government sector has net borrowings.

<sup>27</sup> I'm ignoring *correspondent banks* - see Committee on Payment and Settlement Systems (2003). The role of central bank money in payment systems. CPSS. Basel, BIS., for a fuller explanation that complicates but does not change the argument.

<sup>28</sup> If you don't like the idea of *help* then just assume the government wants to give somebody some money for some reason.

	A <b>bond</b> is just a bill with more than a year till its repayment.	
<i>May</i>	<i>Isn't this just playing with words? the government account was already a liability?</i>	
<i>Money penny</i>	Some people like this approach because it looks like the CB balance sheet will balance. Not everybody looks at the total government spending as a drawing down of a bank account with the CB.	
	So you're right May, the country's balance sheet always balanced anyway. When the government account went down, the people's accounts went up. When the government sold the bill the liability just got shifted to another form.	
	The government can also sell bills to the people instead of the CB.	
<i>Neo</i>	<i>What if nobody wants to buy the government bills? Won't their price have to drop?</i>	
<i>Money penny</i>	We'll answer this later.	
	<b>Government Taxes and Fees</b>	
	The government also takes money from people. This is called taxes and fees.	
	The taxes and fees must be paid in cash or credit transfers from banks with an ES account.	
	The amount of net physical money flow (cash) from the government is small, and we'll ignore this. Anyway, the government ends up giving almost all of this cash to the people anyway.	
	If we all used credit cards or debit cards then we wouldn't need cash.	
	When the government spends money the peoples' bank accounts go up. When the government demands money the peoples' bank accounts go down.	
	The same thing happens to the bank's ESAs.	
	If the government takes more money than it spends it is called a <i>surplus</i> . The opposite is called a <i>deficit</i> .	
	When the government has a surplus then the peoples' bank accounts and the banks' ESAs go down.	
	Taxes and fees given to the government is equivalent to destroying money, just like the government spending money or giving money to people is creating money.	

	There is no direct linkage between taxes and fees demanded by a government, and the spending of a government. Governments do not need to raise taxes or borrow money in order to spend money	
	If bank accounts are too hard to think about, then imagine just using cash. When the government gets cash by taxes it burns the bank notes and melts down the coins <sup>29</sup> . When it needs to spend money it prints new bank notes and mints new coins.	
	If the government has a deficit it is creating money, if it has a surplus then it is destroying money.  Frank is <b>sure</b> this wasn't in his economics course.	
	<b>Private Sector Saving</b>	
<i>Neo</i>	<i>What happens if we all want to save money? That's a good thing isn't it? My mummy and daddy need to save for their retirement in 35 years time<sup>30</sup>.</i>	
<i>Money penny</i>	Let's call the non-government part of the economy the <i>private sector</i> .	
	If you want to save money using bank accounts or bills from companies then every one of these instruments has a corresponding liability. The private sector as a whole has no net savings.	
	If ordinary people want to save with the private sector then there has to be part of the private sector that wants their savings, otherwise the savings will just accumulate and earn no interest.	
<i>Kay</i>	<i>Why wouldn't the banks pay them interest?</i>	
<i>Money penny</i>	The banks only want to take deposits if they've lent the money out to somebody. If more people want to deposit money than the banks can find lenders then the banks will not give the depositors any interest.	

<sup>29</sup> This is not far-fetched. As mentioned on p46 Wray, L. R. (1998). Understanding Modern Money: The Key to Full Employment and Price Stability, Edward Elgar Publishing., hazelwood tallies were used as a record of debts and credits by the UK Exchequer up till 1826 and were effectively used as money. In 1834 a large number were burnt in the furnace of the Houses of Parliament, which overheated and caused the Houses to burn down.

<sup>30</sup> Yes, the class is 6 years old now, their parents are 35, and when they reach retirement age it will have to be beyond 70 years of age.

	If the depositors still want to put money in the banks with no interest, then the banks will start charging them fees so that they can still make a profit.	
<i>Neo</i>	<i>Then why not invest money in the stock market? My parents say that is always a good investment for the long run.</i>	
<i>Money penny</i>	A share in a company is still a financial asset and leaves the net financial assets of the private sector at zero. If you buy a share your cash holding goes down and your share assets go up by the same amount. The person who sold the share now has cash and their cash holding goes up.	
	Also consider, if shares are so good then why has the person who originally held the share sold it?	
	It doesn't matter whether a person saves via bills or shares, we still have net zero financial assets in the private sector. Some parts of the private sector can save only if there is another part of the private sector that wants to be a borrower.	
	The only way the private sector can be a net saver is if the government sector runs a deficit.	
	The simplest way to see this is to imagine a world where all money is cash. If people want to save by putting coins in a piggy bank then the coins have to be issued by the government and be in surplus above what the government demands back in taxes and fees.	
	That's a government deficit.	
	Now this really wasn't in Frank's basic course. What was he being taught? Ah now he remembers! Back in the early 1970s all the textbooks were written during the Bretton Woods era, effectively a gold standard. He hopes the textbooks have improved by now <sup>31</sup> .	
<i>Neo</i>	<i>What if the government makes the deficit so big that there is more money than people want to save? What happens to the extra money? That's what we asked at the beginning of class!</i>	
<i>Karl</i>	<i>How does all this affect actually making stuff? We have to get our lunch from somewhere.</i>	

<sup>31</sup> Unfortunately for many students most of the textbooks haven't improved.

Kindergarten Modern Monetary Theory

<i>May</i>	<i>What happens if the government runs a surplus? Some politicians say this is a good thing.</i>	
<i>Moneypenny</i>	That's enough for today. Let's do something with animals. Let's look at some animals and see what they have in common. Then we can draw what we imagine their last common ancestor looked like. Ok, we'll start with a horse and a bee.	

## Day 3

On the third day there were a number of questions left over.

	<b>Government deficits</b>	
<i>Class</i>	<i>Miss, what happens if the government just makes lots and lots of money, more than it takes in taxes?</i>	
<i>Money penny</i>	The Government has a <i>deficit</i> . Some of that money will be immediately saved by the private sector as we talked about yesterday.  In other words, it will just stay in their bank accounts or will be used to buy financial assets and will then sit in the financial asset seller's account.	
	The extra money that isn't saved will be used to buy various things. This will lead to more things being bought and sold, or if there is no way people can make more things then the prices of things will most probably rise.	
	If people aren't working as much as they'd like, or if factories aren't working as fast as they can then the extra spending will most probably be a good thing.	
	All of the deficit will be sitting in somebody's bank account at all times, so represents net financial assets of the private sector.	
<i>Neo</i>	<i>What happens if the government spends more and more and more money?</i>	
	It depends on what's happening in the economy.	
	Let's say that Adam wants to buy some milk but can't because he doesn't have a job. In fact lots of people don't have jobs.	
	Companies don't want to give people the jobs because they're not sure that they can sell what they make.	
	Banks don't want to lend money to people because they worry that they won't be able to get their money back.	

	What happens if the government gives Adam \$10?	Government account at CB goes down by \$10 Bank reserve account goes up +\$10 Bank liability to Adam - \$10 Adam asset +\$10
	Adam buys \$10 of milk from the milkman	Adam account \$0 Milkman account +\$10
	The milkman gives some money to the dairy farmer	Milkman account goes down Farmer account goes up
	If the milkman and the farmer had spare time and spare milk then this extra activity won't cause them to raise their prices.	
	The economy grows by the amount of spending that the \$10 given to Adam makes as it passes from person to person.	
	The \$10 stays in the banking system as a liability of the bank, and as an asset of whoever leaves some of it in the bank instead of spending it all as it passes from hand to hand.	Adam spends \$10 milkman spends \$9 farmer spends \$8 on clothes tailor spends \$7 ... ... last person saves \$1
	So if there is a lot of spare time and lots of things that people want to sell then this extra money made by the government won't move prices up.	
	On the other hand, let's say the farmer had no spare milk to sell. Then Adam wanting more milk will most probably make the price go up.	
	There is <b>no</b> simple answer to the question of what happens if the government keeps spending money. If there are plenty of people who want to work but can't get a job, and people have plenty of things to sell and no buyers, then the extra government money won't make prices rise.	
	If there are few spare goods, and almost everybody has a job then prices will rise <sup>32</sup> .	

<sup>32</sup> We've come to an important point here, which is perhaps too complicated (maybe unnecessary) for a kindergarten class as it involves a degree of unlearning, and our little kiddies haven't learned bad ways of thinking.

Notice that there is no question about *funding* the deficit, if we consider funding as being via taxation or borrowing. The government can just spend any amount- the additional spending is "funded" via

Class	<i>Is that the only effect of government creating money?</i>	
	No. There is an effect on interest rates.	
	The bank has an extra \$10 in its reserves. If the central bank doesn't pay interest on these reserves then the bank will make more money if it takes the money out of reserves and lends it to somebody.	
	Because the bank needs to find some one <sup>33</sup> to lend the money to, it has to charge a lower rate of interest than normal.	
	The more money the government spends, then the more the bank has in reserves. This means there is more the bank wants to lend and so the interest rate has to go down further.	
	Frank is now extremely confused and needs to unlearn even more stuff. He keeps hearing from some economists that if the government keeps spending then interest rates will have to rise. Now he sees that as long as there is slack in the economy, more government spending will cause interest rates to drop.	
	This can't be right! What country has a very high government deficit and low interest rates? Oh! Japan!	
Class	<i>What happens in the opposite case. What if the government has a surplus and takes more taxes than it spends?</i>	
	Remember in yesterday's class we talked about a surplus being the same as a government destroying money. Well, if there is too much money in the economy then maybe that's a good thing. If there is just the right amount of money, maybe that's a bad thing.	

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*seigniorage*, the creation of money. Walsh (2010) Chapter 4 shows one way to consider seigniorage as one component of funding a government spending.

It is the question of what happens in the economy that decides how much of a surplus or deficit the government should aim at.

Thinking about how a government needs to finance a deficit is one of the institutional frameworks of an economy that hides what is actually happening with fiat money. The nexus between spending and taxing or borrowing is via the effect on the economy, not via an artificial consideration of “funding”.

<sup>33</sup> This is complicated by the inability of banks to exchange CB reserves for ordinary deposits. In most economies the interest rate effect is transmitted through the government bond, note and bill markets.

<i>Class</i>	<i>How can you have too much money?</i>	
	Imagine if a bank was feeling very happy and trusted lots of people. Then it might lend them lots of money. If everybody is already working hard and making all that they could make, then this extra money might just make the price of things go higher.	
	That's too much money.	
	If the government spends less or takes more money in taxes and fees then the money will be taken out of the economy.	
	That would most probably be good.	
	Frank wonders about raising interest rates? Would this have the same effect? It's most probably too difficult for a kindergarten class <sup>34</sup> .	
<i>Class</i>	<i>What happens if the government runs a surplus and there is just the right amount of money in the economy and everybody is working?</i>	
	Let's say Adam now has to pay an extra \$10 in taxes. He decides that he will pay taxes rather than spend the \$10 buying something from Beth.	
	The government keeps this \$10 and so the net financial assets of the private sector has fallen.	
	Beth now has \$10 less money coming in, and so she has to decide where she will stop some of her spending or saving.	
	If Beth cuts her spending by \$10 then somebody else has to then cut their spending or saving by \$10. The net financial assets will shrink.	
	But there was another way Adam could get his \$10. That is by borrowing the money from the bank.	
	When we looked at bank lending money two days ago, we said that the people who borrowed the money spent it and the money went into their bank account, so the bank still had the same amount of assets as liabilities.	
	This doesn't happen now. Adam takes his money and gives it to the government. The bank has to find someone who is willing to lend it \$10.	

<sup>34</sup> This is a difficult topic and Ms Moneypenny will get to it when she has taught the class a bit more.

	Whoever lends the bank \$10 will have \$10 less to spend and the economy will shrink like it did before.	
	So if the government runs a surplus then the economy will shrink <sup>35</sup> .	
<i>Neo</i>	<i>But isn't the government saving this surplus?</i>	
<i>MP</i>	You weren't listening properly yesterday! Where does the government put this surplus? It is just a number in a ledger.	
	You and I can save money, but the government is a different sort of thing.	
<b>Government saving in financial assets</b>		
<i>May</i>	<i>What happens if the government wants to save? Who is it going to give the money to?</i>	
<i>MP</i>	The government has to buy something from somebody. If it buys a person's labour or their physical asset then that is just the same as the government spending money.	
	If the economy has some slack then prices may not rise, but if the economy has no slack then the spending may increase prices.	
	If the government buys financial assets then the price of those assets may also be pushed up, unless there is more of the financial assets than people want. The price that the government pays for the financial assets will be transmitted as cash into that person's bank account.	
	So government "saving" is just like "spending". It creates net financial assets in the private sector.	
	In fact, the more the government saves like this, then the lower will be the surplus. If the government tries to save all the "surplus" then there really isn't a surplus <sup>36</sup> .	Government spending + "saving" = private income + assets

<sup>35</sup> In modern times, when governments have a run of (true) surpluses they have always been followed immediately by a recession. It is difficult to show causation in these instances as an exogenously caused recession will usually stop surpluses because of automatic stabilisers.

The importance of the logical argument in class is that it shows that there is an important effect on the economy when the government runs a surplus. This effect does not depend on theories of money, it is a simple application of stock/flow analysis.

<sup>36</sup> On the other hand, if the government just leaves the money sitting at its CB on the government account then this is equivalent to the money being destroyed – there is no effect on the private sector. The money is "recreated" when the government spends by either buying assets, labour, or private

Kindergarten Modern Monetary Theory

<i>Karl</i>	<i>So if the government is running a surplus because the economy is hot, then spending that surplus by buying assets may just cause price rises.</i>	
<i>MP</i>	Very good, Karl. If the government wants to slow an economy by having a surplus then it can only do this by destroying the money.	
	If the government has a surplus when the economy is not overheating then it is shrinking the economy by destroying the private sector's net financial assets. If the banks keep lending fast enough then the economy may keep growing because we see the amount of buying and selling still going up.	
	If the government keeps taking more money than it spends then the private sector may eventually reach a point where it feels that its net financial assets are too low.	
	At this point some people might start to try to save more assets. This will slow the economy as we discussed earlier.	
<i>MP</i>	Now we're finished this topic. There is a lot more to discuss but that's enough for now.	

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sector financial assets. Any interest payment on the “balance” kept at the CB is just a fictional accounting entry – the government has no more capacity to spend than it did otherwise.

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## Day 4

On Day 4 the class wants to discuss something that was passed over on Day 1 – what about the rest of the world? Does it have an effect on the conclusions about modern money?

<i>Class</i>	Miss, you ignored the rest of the world when we talked about money before. But we get lots of our phones and other things from overseas, what if they didn't want our money? Why would they sell us things?	
<i>May</i>	<i>I still want to talk to my granny in England on the phone each day, but if nobody wants my mummy's dollars then I can't do that.</i>	
<i>Money penny</i>	It's a little more complicated than last time, but in the end it's about people, and groups of people, trusting each other.	
	<b><i>The major players</i></b>	
	Here are the Australian people	
	Here is their Government.	
	Here is the rest of the world –it's made up of people and governments too.	
	<b><i>The Real Economy – Again</i></b>	
<i>Money penny</i>	Just like in our economy, we like to swap and trade things with people in other parts of the world. When we add up all the trading between people all over the world it's called the <i>global economy</i> .	
<i>Class</i>	<i>What is the size of the global economy?</i>	

<i>Money</i>	The global economy is much bigger than any one country's economy. Like I mentioned earlier, if we add up all the cash and credit that people use to buy things in a year then that is one way to guess the size of the local economy in that year, we can do the same thing for the world. What makes it harder is that different countries use different sorts of money.	
	<b>International Money</b>	
	All countries <sup>37</sup> have some form of physical money - <i>cash</i> .	
	Countries <sup>38</sup> also have their own Central Banks. These CBs have Exchange Settlement Accounts (or Reserve Accounts) that their local banks use as part of their payment system.	
	People put a price <sup>39</sup> on the things they want to get, or get rid of <sup>40</sup> , in their own currency	
	One of the things you can buy is an amount of another country's money. Let's use an example to keep this as easy as possible – an Australian, Sheila, wants to use Australian dollars to buy a British pound.	$\$ \rightarrow \pounds$
	A Briton, Tommy, may want to sell their pound for \$2.00. This price is called an exchange rate – £1 = \$2.00	
<i>Neo</i>	Miss, all British prices are in pounds, why isn't the price of a pound also given in pounds?	

<sup>37</sup> Miss Money doesn't want to go into the messiness of the Eurozone, and for the purposes of this discussion she is treating that zone as one country, which, in terms of this discussion, is entirely accurate.

<sup>38</sup> She is keeping things at the level of developing and developed economies. She doesn't want to discuss the problems of countries that are so mismanaged they don't have a credible central bank. This includes the Eurozone.

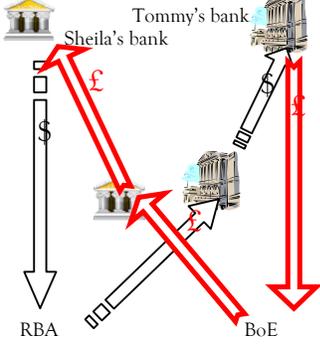
<sup>39</sup> We are not going to get into the vexed question of "value" in this discussion because we are talking about money, and so the only thing we can see are the transactions being undertaken. Because we are looking at the mechanics of money we will also assume that any issue of coercion in these transactions can be ignored – essentially the transactions are freely entered into.

<sup>40</sup> "Things" include services and intangibles.

<i>Money</i> <i>penny</i>	It is, Neo! The price of a pound in pounds <sup>41</sup> is always a pound! But if somebody wants to buy a pound using dollars then you have to give the price in dollars.	
	It's the same when Sheila wants to buy or sell a dollar, she has to give the price in pounds to Tommy.	
	Frank has to be very careful here. He is always confused when talking about currency and is likely to get things backward..	
	The exchange rate £1=\$2 is also the same rate that would be used if Sheila wanted to sell dollars. She would sell \$2 for a price of £1.	
	If Tommy and Sheila were happy with cash then they could swap a \$2 coin for a £1 coin and that would be that. But if it was \$2m and £1m then we need to go through the payment systems.	
	Tommy and Sheila each need an account in dollars and pounds – one for paying and one for receiving. This is two bank accounts each.	
	Sheila is going to give \$2m to Tommy and receive £1m in exchange.	
	If Tommy and Sheila both use the same Australian bank <sup>42</sup> then that bank decreases Sheila's dollar account by \$2m and increases Tommy's dollar account by \$2m.  Tommy's pound account is decreased by £1m and Sheila's pound account is increased by £1m.	<b><i>Sheila</i></b> <b><i>\$2 → Tommy</i></b> <b><i>Tommy</i></b> <b><i>£1 → Sheila</i></b>

<sup>41</sup> Things are actually a little trickier than that. As discussed on Day 2, the payment system allows credit in a bank account to be transferred to some other bank in the banking system. At the root, this is done via the RAs. There is an implicit one-to-one exchange rate between a dollar (or pound) in a bank account and a dollar (or pound) in a RA.

<sup>42</sup> Note that this bank must offer both dollar and pound accounts.

	<p>If Tommy and Sheila use different banks, which is quite common if they are in different countries, then the dollar cash flows go through the Australian payment system and the pound cash flows go through the UK payment system.</p> <p>The banks need to have an account with some bank in the other payment system for this to work. In other words, Sheila's bank has to have a pound account with a bank in the UK payment system so it can access that payment system. And vice versa<sup>43</sup>.</p>	 <p>The diagram illustrates the flow of funds between two banks in different countries. Tommy's bank is in Australia, and Sheila's bank is in the UK. The Reserve Bank of Australia (RBA) and the Bank of England (BoE) are also shown. Red arrows indicate the flow of pounds (£) from Sheila's bank to Tommy's bank and from Tommy's bank to the BoE. A white arrow shows dollars (\$) flowing from the RBA to Tommy's bank. Another white arrow shows dollars (\$) flowing from Tommy's bank to the BoE.</p>
	<p>The Australian bank may own the bank in the UK with access to the payment system. Similarly for the UK bank owning an Australian bank.</p>	
	<p><b>International Trade</b></p>	
<p><i>Karl</i></p>	<p><i>Miss, why do Australian banks have to borrow overseas? My mum says this is letting us be controlled by foreigners.</i></p>	
<p><i>Money penny</i></p>	<p>Let's see what happens when somebody buys something from overseas.</p>	
	<p>Sheila wants to buy an Aston Martin One-77 from Tommy. This costs £1m. She will have to find \$2m to pay for this.</p>	
	<p>Sheila buys £1m from her bank for \$2m and asks Aus Bank to put this into Tommy's UK Bank account. To do this, Aus Bank buys £1m from UK Bank and transfers this to Tommy's account. Let's look at what happens in detail.</p>	
	<p>We will assume that Aus Bank has a pound account with UK Bank, and UK Bank has a dollar account with Aus Bank<sup>44</sup>.</p>	<p>?</p>
	<p>Aus Bank adjusts Sheila's account down by \$2m.</p>	
	<p>Aus Bank credits UK Bank's dollar account by \$2m.</p>	
	<p>Aus Bank starts with a \$2m liability (to Sheila) and ends with a \$2m liability (to UK Bank).</p>	

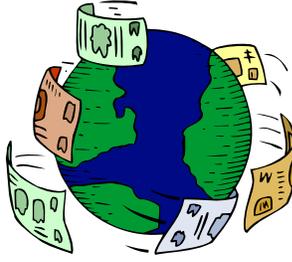
<sup>43</sup> Settlement most probably would be done via CLS Bank's continuous linked settlement accounts, but as these effectively clear through the central banks this is left out of the discussion. See <http://www.cls-group.com/About/Community/Pages/CentralBanks.aspx>

<sup>44</sup> We're talking about correspondent banks with their nostro and vostro accounts.

	UK Bank credits Aus Bank's pound account by £1m.	
	UK Bank transfers £1m from Aus Bank's account to Tommy's account.	
	Aus Bank starts with no pounds and ends with no pounds.	
	Notice what has happened here. Aus Bank now has a liability of \$2m to UK Bank. UK Bank has a \$2m asset in Australia.	
	There has been no growth in credit in dollars.	
	UK Bank started with nothing and ends with a \$2m asset (owed by Aus Bank) and a £1m liability (to Tommy) <sup>45</sup> .	
	There has been an increase of £1m in credit in pounds. It looks like UK Bank has lent more pounds.	
	If there are no other overseas transactions in the opposite direction then Aus Bank has a liability to UK Bank at the end of the day.  This is exactly the same position that Aus Bank would have if it had borrowed \$2m from UK Bank.	
	What this means is that Aus Bank automatically looks like it has borrowed from overseas whenever it helps one of its customers buy something from overseas.	
	Note very carefully: Aus Bank did not have to explicitly borrow money overseas, the liability occurred when Aus Bank bought £1m from UK Bank and UK Bank was comfortable having a \$2m asset at Aus Bank (its positive account balance). UK Bank has bought the \$2m account for £1m.	
<i>May</i>	<i>What happens if no one wants to sell pounds to Aus Bank?</i>	
<i>Money Penny</i>	Aus Bank would not be able to sell the pounds to Sheila, so she would have to go to another bank (XYZ) for the pounds. The dollars would be shifted from her account through the ESA to XYZ bank and things would go through as we've just explained.	

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<sup>45</sup> UK Bank has a currency mismatch. There has to be someone in this series of transaction who ends up with a currency mismatch as we have a physical asset that has its price denominated in pounds being bought by someone using dollars.  
It could be Sheila, who could borrow pounds directly; or Tommy, who could just accept the dollars; or Aus Bank, who could credit Tommy using its £ESA without buying new pounds.

	<b>Complicated part that can be ignored</b>	
	Things get more complicated if we look at what happens if Aus Bank and UK Bank don't have accounts with each other and Aus Bank buys pounds through another bank – XYZ Bank.	
	Aus Bank \$ESA is reduced by \$2m and XYZ Bank's \$ESA is increased by \$2m <sup>46</sup> .	 <p>Aus \$</p> <p>XYZ \$</p>
	XYZ Bank's £ESA is decreased by £1m and Aus Bank's £ESA increased by £1m.	
	Aus Bank transfers £1m from its £ESA to UK Bank's £ESA and £ESA credits Tommy's account with £1m.	
	Aus Bank starts with no pounds and ends with no pounds.	
	Aus Bank starts with a \$2m liability (to Sheila) and a \$2m asset in the \$ESA. It ends with an \$ESA which is \$2m lower than it started and no \$2m liability. Its balance sheet still balances	
	XYZ Bank ends with \$2m extra in its \$ESA (a new asset) and £1m less in its £ESA (less assets). Its balance sheet still balances <sup>47</sup> .	
	UK Bank started with nothing and ends with a £1m more assets in the £ESA and a £1m liability to Tommy.	
	If Aus Bank needs to find \$2m to get its \$ESA back up to its original size then it knows that XYZ Bank may have too many dollars and so it should be able to borrow them.	
	When Aus Bank borrows from XYZ Bank we have \$2m transferred from XYZ's \$ESA to Aus Bank's \$ESA and Aus Bank has a \$2m liability to XYZ Bank.	This is explicitly borrowing money from overseas (if XYZ is overseas), but see the later discussion on other ways Aus Bank could fix up its shortfall..

<sup>46</sup> This could be happening through CLS Bank. I have removed CLS Bank from the description and presume everything is operating through the ESA of the central banks.

<sup>47</sup> But the balance sheet needs to be adjusted in the future as the exchange rate moves - profit or loss will appear.

	Aus Bank has a \$2m asset in its ESA and a \$2m liability to XYZ. XYZ has \$2m fewer assets on its ESA which is matched by a new \$2m asset from Aus Bank.	
	So, whether it looks like an Australian Bank has borrowed overseas depends on whether it has accounts with other overseas banks or it has to settle its buying and selling through ESAs.	
	<b>Complicated part finished</b>	
<i>Karl</i>	<i>What if the foreign bank wanted its money back?</i>	
<i>Money penny</i>	Let's take the first case: Aus Bank has a \$2m liability to UK Bank. It now needs to pay that \$2m.	
	Let's also assume that UK Bank has a \$ESA.	
	Aus Bank moves \$2m from its \$ESA to UK Bank's \$ESA. This pays back the loan.	
	Aus Bank has \$2m less assets in its \$ESA and \$2m less liability. Its balance sheet still balances and is \$2m smaller..	
	UK Bank has \$2m more assets in its \$ESA and \$2m fewer assets in its loans. Its balance sheet still balances and is the same size.	
	The amount of credit in \$A is \$2m lower.	
	The total amount of money in the ESAs stays the same.	
<i>Karl</i>	<i>What if Aus Bank didn't have enough in its \$ESA?</i>	
	There are a number of ways this could be done.	
	The simplest would be for Aus Bank to borrow \$2m from someone who doesn't bank with Aus Bank – this could even be another bank. This then would transfer \$2m from their bank's \$ESA into Aus Bank's \$ESA.	Borrow
	The total amount of credit in the system stays the same.	
	Secondly, Aus Bank could sell some of its assets to someone for \$2m and this would be transferred to the Aus Bank's \$ESA.	Sell assets 
	Notice that the assets need to be sold to someone who doesn't bank with Aus Bank so that there can be a transfer of money between the two ESAs.	

	The total amount of credit in the system stays the same.	
	If Aus Bank sold one of its assets to a depositor for \$2m then it would reduce the depositor's account by \$2m. This would reduce Aus Bank's balance sheet by \$2m but would not change its \$ESA.	
	Thirdly, if Aus Bank has good quality assets <sup>48</sup> then the RBA may buy them and credit the \$ESA.	Sell to central bank
	Fourthly, the RBA may lend \$2m to Aus Bank for a short period of time –the RBA will credit \$2m to Aus Bank's ESA <sup>49</sup> .	Borrow from central bank
	Notice in all this that the total amount in the \$ESA either stayed steady – if the banks did something with other people – or the amount went up – if the bank did a transaction with the central bank.	
<i>Karl</i>	<i>What if no foreign bank wanted to have a positive account with an Australian bank? Wouldn't they cause a massive crash?</i>	
<i>Money Penny</i>	There would be a big shift of \$ESA assets from accounts of Australian banks to accounts of foreign banks. This may cause all the Australian banks to have amounts in their \$ESA below what the central bank likes, or the amounts may even be negative. <sup>50</sup>  I told you ways that the banks who are short can solve this problem earlier. In the short-term the only way to fix this is for the RBA to lend money <sup>51</sup> to the Australian banks.	
	Notice that the foreign banks still own A\$.	
<i>Neo</i>	<i>Where does the RBA get the money? It can't just come out of thin air!</i>	

<sup>48</sup> Such as Australian Commonwealth Government Bonds

<sup>49</sup> Of course the third and fourth methods are often combined in a repo transaction.

<sup>50</sup> This distinction between Australian and foreign banks is arbitrary, it could just as easily describe some other subset of banks having ESA assets moved from them. These would then be short ESA cash but other banks would be equally long. There can be a run on a subset of banks but there can't be a run on the banking system as a whole – apart from cash, the only way to get money out of a bank is to transfer it to another bank or else buy something with it, which then transfers the money to the account of the seller.

<sup>51</sup> Via repo transactions usually.

<i>Money penny</i>	Neo, you've forgotten our earlier lesson. The central bank is a bank, and can create credit the same way as any other bank. There is no physical limit to how much it can create, though there may be other limits.	
<i>Karl</i>	<i>What if all the foreign banks wanted to get out of Australian dollars? What if they didn't trust the \$ESA amounts at the RBA.</i>	
<i>Money penny</i>	First we need to notice that we made things too simple in our talk earlier. We made it seem that all the people who had an account in dollars and who owed pounds were foreign banks, and all their holdings were in \$ESAs..	
	This doesn't have to be the case; it could be companies and people who have the mismatch directly. This does not change the discussion below.	
	We also need to be careful about what we mean when we say the banks don't trust the \$ESA amounts at the RBA. There are two separate things – the safety of the amounts of the \$ESA, and the fact that the assets in A\$ aren't matched by debts in A\$.	
	The amount in the bank's \$ESA can only be made smaller by a deliberate act of the Australian government. This is a political question and won't be discussed here <sup>52</sup> .	
	If a foreign bank wants to reduce its net exposure to A\$ then it has to find someone who would want to buy A\$. This would then allow it to reduce its dollar holdings by transferring the amount to that other person.	
<i>Karl</i>	<i>What if it's a person who wants A\$?</i>	
<i>Money penny</i>	The person (P) who buys the A\$ has to have an A\$ bank account, and the bank that has P as a customer will have the \$ESA account. This will be matched by the account with P so it won't have a net exposure to dollars.	
	If nobody wants to buy dollars at the current price then the price of dollars will have to drop until somebody is willing to buy dollars at the lower price.	

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<sup>52</sup> The economic and political situation would have to be extreme for this to be contemplated by the government. Even in the turmoil of the GFC there was no sovereign country that contemplated this. Note that Iceland defaulted on its GBP and EUR obligations, not its ISK obligations.

	The people who start with assets in dollars will lose when this happens because their assets in dollars will be worth less in the foreign currency, while their debts in the foreign currency will still be worth the same amount.	
<i>Neo</i>	<i>What if nobody wants to buy dollars at all!</i>	
<i>Money penny</i>	Nothing will happen – there will be no foreign currency exchanges for dollars. The people who have dollars cannot buy foreign currency and the foreigners who have dollars cannot sell them. All transactions in dollars will continue as normal.	
	That nobody would want to buy dollars is very unlikely. There are lots of Australians who have some foreign currency and when the price of dollars gets cheap enough then Australians will buy dollars with the foreign currency they own.  It is quite likely they will get many more dollars for the foreign currency than they paid for it.	
	Or, Australians that have physical assets that foreigners want, like iron ore, could sell the iron ore to someone who has dollars and have the A\$ transferred to their account.	
<i>Karl</i>	<i>What if it's not foreign banks that own the dollars but it's foreign people or companies?</i>	
<i>Money penny</i>	There's not much difference. The people with the dollar assets have to find someone who wants the dollars. Otherwise they are stuck with them.	
	If a person P has lent ABC bank \$Xm, say by owning a bank bill, then when this needs to be repaid ABC bank puts \$Xm into P's account.  If P then wants to get rid of this money they have to find someone who wants dollars. It's the same problem that the bank had.  If P doesn't want the dollars to be owed to it by ABC bank then they have to transfer them to a bank that they do trust.	
<i>May</i>	Miss, I've heard that Australian banks have borrowed overseas and could have a problem if foreigners don't want to lend to them anymore.  Is that true?	
<i>Money penny</i>	You shouldn't believe everything you've heard, especially in newspapers, and especially if the banks tell you it.	

	Let's assume that the banks have borrowed only in A\$.	
	We have a simple question to ask given what we have discussed up to now. What are the foreigners going to do with their A\$?	
	Their A\$ will be in a bank account or be an financial asset like a bill for A\$1m. When the bill matures the bank will create the A\$1m in the foreigner's account <sup>53</sup> and destroys the bill.	<i>Assets still match liabilities, which have just changed form, not amount.</i>
	The foreigners are stuck with A\$. The only way they can get rid of them is to find an Australian who wants them for a sufficient price in another currency.	
	So the problem is not with Australian banks if the foreigners want to reduce their lending, the problem is with the foreigners. How are they going to reduce their A\$ holding?	
	The reason it seems to be a problem is that people forget that the whole banking system acts in a different way to an individual bank.  A single bank may have a problem if people don't want to lend to it, but the banking system as a whole does not have a problem.	
	<b><i>The Payment System</i></b>	
<i>Neo</i>	<i>Where does this Australian money actually live? Is it overseas or is it in Australia?</i>	
<i>Money Penny</i>	Remember that, apart from cash, the money that ordinary people have is just a promise from a bank that they have a certain number of dollars in their bank account.	
	This bank account can be used to pay bills and buy things through the banks' payment systems.	
	The payment system operates through the central bank's Reserve Accounts.	
	If the bank that has your A\$ account is overseas then you, and everyone you want to buy things from, have to trust that bank to operate the A\$ accounts in a sensible fashion.	

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<sup>53</sup> This is the opposite operation of the bank destroying A\$ in an account when it originally sells the bill.

	The simplest way for this to happen is for the overseas bank to be connected to the Australian payment system <sup>54</sup> .	
	And that is quite enough for today.	

For more background on these ideas a partial bibliography is: (Wray 1998), (Wray 2007).

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<sup>54</sup> This is the usual case. See, for instance, paragraph from p7 of He, D. and R. N. McCauley (2010). "Offshore Markets for the Domestic Currency: Monetary and Financial Stability Issues." [SSRN eLibrary](#). *That said, it should be clear that in the normal case the offshore market does not exist in isolation. In fact, the payment flows associated with these accounts and investments ultimately pass through bank accounts in the United States, just as payment flows associated with non-bank financial intermediaries in the United States ultimately pass through banks in the United States. While the US authorities put in place capital controls from the late 1960s until the early 1970s, they never impeded the flow of payments through US banks to allow the settlement of offshore trade and investment transactions. Offshore markets in a currency can flourish if offshore financial institutions are able to maintain and to access freely clearing balances in the currency with onshore banks (Dufey and Giddy (1978)). In other words, non-resident convertibility of the currency is allowed at least for overseas banks. Once this condition is met, both long and short positions in the currency can be built up offshore even without a wholesale liberalisation of capital account controls by the onshore country authorities. If offshore banks do not have free access to clearing banks kept with onshore banks, then offshore markets can still exist, though in a more limited fashion, through non-deliverable contracts, as argued below.*  
 What are these non-deliverable contracts? Interest rate swaps and forward currency contracts.  
 Notice that He and McCauley say, contrary to what some people expect, Eurodollar accounts in London eventually clear through the US.

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