# Modern money – what it is, how it emerged, and its desirable and undesirable features

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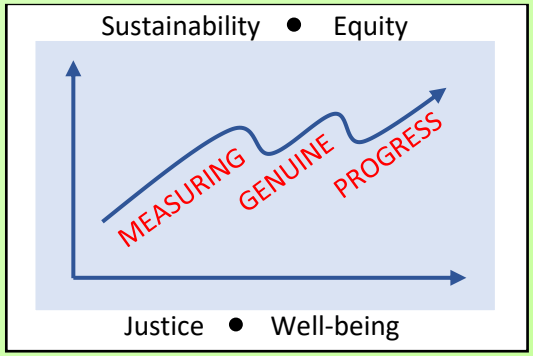
**Measuring Genuine Progress**



# What is meant by ‘modern’?

- **‘Modern’ is an arbitrary term used to describe something that has existed in a functional form much as it does today**
- **Something that once existed in a functional form not like it does today is ‘pre-modern’**
- **For some things, ‘modern’ may mean within one year, meaning that if the thing we are talking about is two years old, it is ‘pre-modern’**
- **For other things, ‘modern’ may mean within the last ten years or within the last fifty tears**
- **In the case of modern money, it is approximately 5,000 years (see Graeber, *Debt: The First 5,000 Years*)**
- **How can something that is 5,000 years old be modern? – see definition above**

# What is modern money?

- To describe modern money, it is necessary to tell the story about the advent of modern money
- But before we can do this, we need to know the mainstream 'mythical' story about money – the story you find in a mainstream economics textbook
- Mainstream view
  - Agriculture emerged (Fertile Crescent and later spread) – it increased the food-producing capacity of humans and therefore freed the hands of many humans; it assisted in the advancement of knowledge and the emergence of cities/empires (this part of the story is true)
  - As technologically advancing societies produced more and a greater variety of physical goods, exchange of goods began – but it was based on barter
  - To be successful, barter requires the 'double coincidence of wants' – person A has too much X and not enough Y and needs to exchange with another person (person B) with not enough X and too much Y – barter is very inconvenient
  - Money subsequently emerged as a medium of exchange to overcome the inconvenience of barter
- This is nonsense! – there is no archaeological or anthropological evidence to support the latter part of this story – it simply never happened anywhere in the world

# What is modern money?

- The clue as to why the advent of money could not have followed the emergence of barter-based markets lies with the mainstream mythical money story itself – if barter is too inconvenient to facilitate exchange, how could barter-based markets have possibly materialised?
- For markets to exist, a medium of exchange must come first – a medium of exchange had to precede the development of markets
- Reply: "If a medium of exchange had to exist for markets to emerge, wouldn't markets have to exist before a medium of exchange came into being?" – a case of "what came first, the chicken or the egg?"
- Answer: modern money was not introduced to serve as a medium of exchange – it was developed for an entirely different purpose
- Once modern money was introduced, it inadvertently (inevitably, in my opinion) became a medium of exchange, just like many human inventions end up being used for beneficial purposes not originally intended (not unlike exaptation in biological evolution)
- Consequently, markets were born, even though they were primitive and peripheral to every-day life (pre-modern markets)
- Unfortunately, perhaps intentionally, the initial purpose of modern money is misunderstood today and repeatedly overlooked when mainstream economists list the features/functions of modern money

# What is modern money?

- We know that money first emerged in a primitive form as nothing more than a 'unit of account' and long before markets existed – it had no other function (Graeber, 2011, *Debt: The First 5,000 Years*)
- Pre-modern money was a way of recording debts – one vertical line in a clay tablet meant you owed me a pig; one horizontal line meant you owed me a cow; one circle meant you owed me one of your daughters
- Civilisations/empires usually consisted of an emperor, other privileged individuals, a small bureaucracy, a large army, and a very large number of enslaved people
- The army was required to protect the emperor's territory and private riches/monuments and manage the enslaved population
- Slaves were used to produce riches for the emperor and other privileged individuals and build monuments in honour of the emperor
- This was very inefficient – a large army consisting of the empire's most abled people were not being used to produce riches/wealth
- How was this issue resolved? The emperor issued his own currency by paying most of the plebs to produce/build useful stuff instead of enslaving most of them and by purchasing the useful stuff that some plebs were capable of producing independently (Note: payment to work rather than enslavement of much of the population reduced the likelihood of insurgency, which was a constant threat)

# What is modern money?

- You might ask, “why would the plebs want to sell useful stuff or work for the emperor to possess this ‘currency’ that had no use value?”
- What emerged hand-in-hand with modern money was taxation – the emperor imposed a tax liability on the plebs that was extinguishable only in the emperor’s currency
- The plebs needed to acquire the currency to pay their taxes – no currency acquired, no payment of taxes, off with your head!
- Taxes created a demand for the emperor’s currency
- An army was still required for military purposes, but many abled people were no longer needed to manage a large enslaved slice of the population – a small bureaucracy was all that was needed to collect taxes and punish those who failed to pay their taxes
- The productive capacity of the empire increased dramatically – more abled people were available to produce/build things; specialisation increased; more people were freed to further knowledge/technology; more people were available to defend the empire and conquer others
- Modern money was born – it, along with taxation, became a very effective way of transferring real resources from what we would today call the ‘private sector’ to the ‘public sector’; previously, the transference of real resources was only possible through tyranny

# What is modern money?

- Things haven't changed – the difference is that the central authority now uses the resources it acquires to build schools, hospitals, etc. instead of personal riches and monuments (plus the penalty today is a large fine or imprisonment, not the loss of your head)
- If we could travel back in time and ask the emperor's 'finance minister' whether he imposes taxes on behalf of the emperor to enable the emperor to pay for real resources and wealth, the finance minister would have laughed and said, "Of course not! In order to spend, we don't need the currency we collect as taxes from the plebs. We impose a tax liability to create a demand for the currency"
- Evidence? Centuries later, tally sticks were used as currency. The tally sticks were burnt when returned as payment of taxes (see next slide)
- In saying the above, the finance minister of yesteryear would have revealed that he knew more about the public finances of a currency-issuing central authority than our present Prime Minister, the Federal Treasurer, the Secretary of the Federal Treasury Dept, 99.9% of economists, and probably all the economists who have won a so-called Nobel Prize in Economics (no such thing! – another myth!)
- Modern money is, and always has been, a creature of the State – it is a social institution. It has always been accompanied by taxation (Chartalism – Knapp, 1905; Keynes, 1930; Lerner, 1947; Wray, 1998)

# What is modern money?

- **Destroyed Modern Money – A bag of shredded banknotes is handed to visitors as they exit the Money Museum at the Kansas City branch of the US Federal Reserve Bank (approximately $165 worth of notes)**
- **Notes and coins constitute a declining share of the money supply as the demand for notes and coins diminishes**

# What is modern money?

- Jared Diamond's famous book, *Guns, Germs, and Steel* (1997), documents the events and good fortune that gave some civilisations enormous advantages over others
- It is my belief that the title of Diamond's book overlooks one key advantage – modern money!
- The title ought to be, *Guns, Germs, Steel, and Modern Money*
- Increased wealth, knowledge, and labour productivity gave the empires using modern money a technological and military advantage over empires that were not
- Empires often clashed – empires with the military, wealth, and technological advantages from having introduced modern money were able to subsume/conquer empires that hadn't
- This, and because many empires needed to harness the benefits of modern money to enjoy the same wealth and military capabilities to ward off invaders, led to the spread of modern money – this goes largely unrecognised, even by historians (e.g., Jared Diamond), because of a lack of understanding of modern money
- Consequently, the historical role and importance of modern money and its continued importance today is overlooked and generally misunderstood, as are the public finances of currency-issuers

# Modern money first; medium of exchange second

- At some point, modern money became a medium of exchange
- Why? Exchange probably became more prominent as private wealth increased, even though, initially, this would have only applied to a small percentage of the population
- Exchange began largely because you didn't have to sell something to the central authority or work for the central authority to obtain the currency to pay your taxes – you could obtain the currency by working for, or selling something to, someone who was paid more of the currency than she needed to pay her taxes
- How? On occasions, the central authority spent more money into existence than it destroyed through taxation – what we wrongly call the authority's 'budget deficit' (more correctly, a 'net fiscal injection')
- People were left in possession of money – what we rightly call 'savings' or the currency-users' 'surplus' (Note: the central authority's net fiscal injection equals the currency-users' surplus)
- This enabled people to use the currency as a medium of exchange (markets were born)
- People accepted the currency as payment knowing there was always a demand for the currency – the 'buyer' of labour or goods (seller of the saved currency) also obtained something with use value

# Features of modern money

- As a medium of exchange, modern money quickly acquired another function – it became a store of nominal exchange value
  - One could now 'save'
  - One could now delay spending (and the mobilisation of real resources)
  - One could now spend less than they earnt to one day spend more than they earnt
- Later still, and with the express permission of the central authority, banking emerged
  - People needed somewhere safe to store their money
  - Banks were allowed to create the central authority's money and 'advance' it into existence (wrongly called 'loans', since banks don't lend deposits; indeed, advances create temporary deposits). The money did not belong to the banks – it remained the central authority's money and had to be converted to the authority's base money on demand – but banks could charge interest on outstanding advances
  - One could now bring spending forward – one could spend more than they earnt now and spend less than they earnt in later years to paid off their debt – this enabled people to purchase high-priced items (e.g., property) without having to save for years to accumulate the required funds (Note: like saving, advances merely shift the timing of spending and the mobilisation of real resources)
- This completed the extraordinary feature of modern money – society now had a spending time machine to delay spending (mobilisation of resources) and to bring spending (mobilisation of resources) forward

# Features of modern money

- There are a number of other firsts associated with modern money
- 1) Financial injections into/financial leakages out of the economy
  - Examples of *financial injections* include:
    - a) Spending by a currency-issuer financed by the currency-issuer's creation of base money – sometimes referred to as the injection of vertical money, since it is injected from the top of the money pyramid (denoted as 'G')
      - This generates the 'hard' (permanent) savings of the private sector
      - Unless the currency is made from, or convertible into, something especially scarce (e.g., gold), the central authority has no fiscal constraint
    - b) Spending by currency-users financed by the creation (and advancement) of credit money – sometimes referred to as the injection of horizontal money, since it is injected from a lower tier of the money pyramid (denoted as 'I')
      - This generates 'soft' (temporary) savings, since they are destroyed when borrowers repay the principal of the outstanding advances
      - Note: the advancement of credit money does not involve the 'lending' of depositors' money (another mainstream myth) – creation of credit money is constrained only by the number of credit-worthy borrowers
    - c) With the emergence of international trade, spending by foreigners on domestically-produced goods and services (exports) – a financial injection into the domestic economy and a financial leakage from a foreign economy (denoted as 'X')

# Features of modern money

- There are a number of other firsts associated with modern money
- 1) Financial injections into/financial leakages out of the economy
  - Examples of *financial leakages* include:
    - a) Saving by currency-users (unspent after-tax income) (denoted as 'S')
      - A temporary leakage
      - Savings ('spending in waiting') can be re-injected into the economy at a later time if and when they are spent
    - b) Taxation by a currency-issuer (denoted as 'T')
      - Taxation destroys the spending power of currency users
      - A permanent leakage
    - c) With the emergence of international trade, domestic spending on foreign-produced goods and services (imports) – a financial leakage from the domestic economy and a financial injection into a foreign economy (denoted as 'M')
  - **Financial injections must equal financial leakages. Why?**
    - Spending on domestically-produced goods and services always begins with a financial injection into the domestic economy (see previous slide for examples)

# Features of modern money

- 1) Financial injections into/financial leakages out of the economy
  - Financial injections must equal financial leakages. Why?
    - Some of the income generated by the initial financial injection (spending) is used to save, pay taxes, and purchase imported goods – all three constitute leakages from the domestic economy
    - The remainder of the income is spent entirely on domestically-produced goods and services – if it is not, it must be one of the three leakages!
    - The subsequent spending generates another round of income, which, because of the leakages, is smaller in magnitude than the income generated by the previous round of spending, thus continuing the spending process
    - Spending on domestically-produced goods & services initiated by a financial injection continues until the entire monetary value of the original injection leaks from the economy, upon which the spending process ends
    - Further spending is only possible via a new financial injection – this logic forms the basis of the expenditure multiplier
    - Total spending on new domestically-produced goods and services (Gross Domestic Product or GDP) = $\bar{A}$ x expenditure multiplier (where $\bar{A}$ = financial injections; and the expenditure multiplier = 1/(percentage of any additional spending that leaks from the system)) (see Appendix 1)
  - Hence: I + G + X (injections or $\bar{A}$) = S + T + M (leakages)
  - Rearranged: (G – T) = (S – I) – (X – M)
  - That is (sectoral balances): 'currency-issuer's balance' = 'currency-users' balance' minus 'external balance'

# Features of modern money

- There are many other firsts associated with modern money
- 1) Financial injections into/financial leakages out of the economy
  - Historically, when did the various financial injections and leakages begin to emerge?
    - First, to recall, two things happened simultaneously
      - 1) the spending into existence of modern money (MM) by a currency-issuing central authority (G) (financial injection)
      - 2) the introduction of taxation by a currency-issuing central authority (T) (financial leakage), which destroyed the MM initially injected into the economy – taxation was required to create a demand for the currency
      - At this point, we have G = T
    - Second, the central authority eventually spent more MM into existence than it destroyed with taxation, perhaps to speed up the building of monuments, irrigation systems, and riches for the elite – the excess MM accumulated in the form of 'hard' savings ($S_G$) held by currency-users (financial leakage)
      - We now have G = (T + $S_G$)
      - Not long after, the existence of savings meant that some currency-users did not have to offer their labour or sell something to the central authority to obtain MM to extinguish their tax liabilities – they could offer their labour or sell something to a currency-user willing to part with their savings
      - MM became a medium of exchange and pre-modern markets emerged

# Features of modern money

- There are many other firsts associated with modern money
- 1) Financial injections into/financial leakages out of the economy
  - Historically, when did the various financial injections and leakages begin to emerge?
    - It is likely that some form of deposit-keeping institution came into existence to safely store the savings of currency-users
    - Third, usury emerged – newly formed institutions were given permission from the central authority (licence) to advance MM to borrowers; the borrowers could use the MM to bring forward purchases of high-priced items
      - The spending of the MM was a financial injection (I); the buyers' receipt of the MM became a form of 'soft' savings ($S_I$) (financial leakage)
      - Note: Eventually, soft savings are destroyed as advances are repaid, although this is usually offset by the issuing of new advances (new financial injections)
      - We now have $I + G = (S_G + S_I) + T$
      - The importance of usury – instead of saving MM over time and purchasing an item in the future, you could purchase the item now and surrender the money you planned to save over time to repay the MM (plus interest payments)
      - The MM created and advanced to borrowers was different to the MM created and spent into existence by the central authority – the former existed as credit money; the latter as base money (only the latter could be used to extinguish tax liabilities)

# Features of modern money

- There are many other firsts associated with modern money
- 1) Financial injections into/financial leakages out of the economy
  - When did the various financial injections and leakages emerge?
    - The institutions that were given permission by the central authority to advance MM (credit money) were essentially the same institutions that stored currency-users' savings – we generally call them banks
    - Note: Just because banks accept depositors' savings and advance MM to borrowers does not mean that banks act as financial intermediaries between savers and borrowers – banks do not lend depositors' savings to borrowers (a mainstream banking myth)
    - Usury completed the full expedient function of MM – it became a spending time machine
      - You could delay spending (save) – i.e., spend less than you earn now in order to spend more than you earn later
      - You could bring spending forward (borrow) – i.e., spend more than you earn now and spend less than you earn later to repay the MM advanced to you (plus interest)
  - Fourth, international trade emerged
    - Exports (X) led to the financial injection of MM denominated in a foreign currency
    - imports (M) led to the financial leakage of MM denominated in the domestic currency
  - We now have $I + G + X = (S_G + S_I) + T + M$

# Features of modern money

- There are many other firsts associated with modern money
- **2) Although all debts are liabilities, we now have a situation where not all liabilities are debts (Note: a *debt* exists when, in order to extinguish a liability, one must give up something that is tangible and has intrinsic/use value)**
  - **A currency-issuer's liabilities are not debts**
    - **A currency-issuer has 100% seigniorage (seigniorage is the difference between the monetary value of the real resources acquired when money is spent and the monetary value of the real resources given up to acquire the spent money)**
    - **A currency-issuer can create base money to acquire real resources without having to give up much in the way of real resources to create the base money ($X of real resources acquired; virtually $0 of real resources surrendered)**
  - **A currency-user's liabilities are debts**
    - **Currency-users have 0% seigniorage – the exception is banks, which can create credit money from nothing and earn interest when they advance it to borrowers (the interest income becomes a new claim on real resources; the interest payment constitutes a lost claim on real resources; thus, interest payments on advances have distributional consequences)**
    - **A currency-user must give up something real to obtain money (sell their labour; sell something they have produced; sell an asset) to acquire real resources ($X of real resources acquired; $X of real resources surrendered)**
  - **In the pre-modern money era, all liabilities were debts – to recall, pre-modern money existed as a means of recording debts**

# Features of modern money

- **Some interesting things then began to emerge, many undesirable**
- **3) Unemployment arose. How?**
  - **People supply their labour to obtain the currency (earn income) in order to finance their spending and saving desires plus extinguish anticipated tax liabilities**
  - **The supply of labour (indeed, the supply of all factors of production) is premised on *anticipated/expected* spending within the economy – one would not supply their labour unless they expected spending to be sufficient to be hired**
  - **The demand for labour (indeed, the demand for all factors of production) depends on *actual* spending within the economy**
  - **Because people want to save and have tax liabilities to extinguish (financial leakages), *actual* spending within the economy is often less than *expected* spending within the economy and therefore less than the spending level required to enable people to fully satisfy their desires/plans and meet their tax obligations**
  - **Consequently, the demand for labour (and all factors of production) is invariably less than the supply of labour (and all factors of production) – unemployment ensues unless: 1) the investment spending by businesses financed by advances and/or the re-injection of past savings/retained earnings, plus 2) the spending by the currency-issuing central government are sufficient to bridge the gap between expected spending and otherwise actual spending**
  - **It took Keynes in the 1930s to work this out – until then, the belief was that supply created its own demand (Say's Law) and that unemployment arose only if factor payment rates (e.g., wages for labour) exceeded market clearing rates**

# Features of modern money

- Some interesting things then began to emerge, many undesirable
- 4) Inflation arose. How?
  - I mentioned that the currency-issuer would sometimes spend into existence more money than it would destroy through taxation, which enabled people to use the money as a medium of exchange (spend now) and save (spend later)
  - Spending could also be boosted (brought forward) by the creation and advancement of credit money and the subsequent spending of it on real resources and goods and services
  - It is more than likely that, at some point, the currency-issuer's spending plus the spending of currency-users would have exceeded the productive capacity of the economy and led to demand-pull inflation
  - If the currency-issuer was determined to spend at a particular level to have certain things built/constructed, the currency-issuer had to do something to reduce the spending of currency-users if it was going to prevent demand-pull inflation
  - It is more than likely that the currency-issuer would have recognised that taxation had to do more than just create a demand for the currency – it also had to be sufficiently levied to regulate the spending of currency-users to quell inflation
  - If this was recognised at the time, the inflation-subduing impact of taxation has since been lost or is nowadays overlooked – taxation is falsely seen as a means for the central government to finance its spending; the demand-reducing impact of taxation is just a fortunate byproduct of taxation levels being sufficient (often more than sufficient given the persistence of unemployment) to quell the inflationary effect of total spending within the economy

# Features of modern money

- Some interesting things then began to emerge, many undesirable
- **5) Economic rents from the sale of resources and goods and services within real economy (money spent within bathtub – see 2nd last slide)**
  - **'Economic rent' is the difference between the market price of something and the minimum price that the seller requires before she/he is willing to supply that something (i.e., economic rent = market price – minimum supply price)**
  - **The minimum supply price is the opportunity cost of supplying something (i.e., the price the supplier must obtain to at least offset the monetary value of what the supplier/seller is willing to surrender)**
  - **When a seller receives the minimum supply price, say $100, they receive a financial claim on something else (i.e., they can now purchase something else worth $100) equal to the financial claim they have just surrendered ($100) – they haven't gained anything other than they have surrendered something they don't want in order to obtain something they do want, which is the basis of 'gains from exchange' (positive-sum outcome)**
  - **When a seller enjoys an economic rent, they gain a lot more than the aforementioned – on top of the gains from exchange, they enjoy an unearned financial claim on real wealth which must be the result of someone else/others suffering a reduced financial claim on real wealth (zero-sum outcome)**
  - **When economic rents are rife, growing inequality often occurs; it is also inequitable (unfair) because someone is getting something for nothing; others are getting nothing for something**

# Features of modern money

- **Some interesting things then began to emerge, many undesirable**
- **5) Economic rents from the sale of resources and goods and services within real economy (money spent within bathtub – see 2nd last slide)**
  - **Instances of economic rents will always occur – a problem emerges when the magnitude of economic rents is large, which many are**
  - **Economic rents arise when something for sale is very scarce, particularly when its supply is absolutely limited (e.g., non-renewable resources, land, the number of Adelaide Crows footballer contracts)**
  - **The richest people in Australia are no longer industrialists, who at least earnt fortunes in the past producing something very useful – they are miners, drillers, pumpers (who extract useful stuff created by Mother Nature), land-owners, owners of retail space, and sportspeople who enjoy large economic rents**
  - **Economic rents (and therefore billionaires) cannot exist in a pre-modern money world – they can only exist in a world of modern money and modern markets**
  - **Absurd ownership of wealth was only possible in a pre-modern money world through tyranny – it can now be enjoyed whilst obeying the law in a suit and tie, performing on a screen or stage, or in a sporting uniform**

# Features of modern money

- Some interesting things then began to emerge, many undesirable
- **6) Economic rents from the sale of designer financial assets and durable assets (money spent within the private sector's vault filled with private sector savings – see 2nd last slide)**
  - **I mentioned that modern money allows people to delay their spending (save)**
  - **A problem with delaying spending is that inflation erodes the spending power of one's savings (Recall: modern money is a store of *nominal* exchange value)**
  - **To maintain the spending power (*real* exchange value) of your savings, you can exchange your 'cash' for an asset that can be traded in a market – it may be a financial asset (shares), a rare durable asset (a Picasso painting), a commodity (gold), or a crypto-commodity (Bitcoin)**
  - **The spending power of your savings is maintained if the asset value rises at the rate of price inflation (Note: you realise the capital gain of the asset when you sell the asset at a time when you want cash to purchase a preferred form of wealth)**
  - **Sometimes the asset rises in value much faster than the inflation rate – if so, you will enjoy an economic rent of sorts in the sense that your financial claim on real wealth has increased without you having contributed to the production and maintenance of real wealth (some of the largest personal fortunes are unproductively generated within the vault, not within the bathtub/real economy)**
  - **An entire parasitic industry has emerged to create designer financial assets and speculative asset markets, and to lobby for tax breaks for the purchase and sale of durable assets to enjoy economic rents – it has further increased income and wealth inequalities and made many assets (e.g., property and staple foods traded on futures markets) unaffordable to many people; it has also rendered financial systems more fragile**

# Features of modern money

- Some interesting things then began to emerge, many undesirable
- **7) Financial systems are now subject to instability – spending collapses within the currency-using sector become a possibility**
  - **In the pre-modern money days, the monetary system never collapsed**
    - **Only the real economy (society's productive capacity) could collapse, which it did from time to time because of war, civil unrest, pestilence, or natural disaster (e.g., flood, drought, earthquake, climate change)**
    - **New 'money' only arose when a new debt emerged – "For doing X, you owe me a pig" (often a punishment), which may have been recorded in the form of one vertical line in a clay tablet**
    - **One did not 'receive' a vertical line in a clay tablet that allowed them to purchase a pig (a medium of exchange)**
  - **With modern money, it was possible to have too little spending/income within the economy to enable the currency-using sector to finance its entire spending and saving desires and have enough left over to extinguish expected tax liabilities**
  - **This could arise if there was too little spending financed by new financial injections – examples include:**
    - **insufficient business investment spending financed by advances of new credit money (I)**
    - **insufficient spending of base money by the currency-issuing government (G)**
    - **a dramatic fall in export income (X)**

# Features of modern money

- Some interesting things then began to emerge, many undesirable
- 7) Financial systems are now subject to instability – spending collapses within the currency-using sector become a possibility
  - If there is 'too little' aggregate spending (income) for the currency-using sector to finance its desires and meet its tax obligations, the currency-using sector (especially households) must do one of two things:
    - 1) reduce its discretionary spending to maintain its net savings desires (Note: change in net savings = change in financial assets (new savings) minus change in financial liabilities (new borrowings))
    - 2) reduce its net savings to maintain its spending desires. It can reduce its net savings desires by:
      - a) reducing new savings (i.e., allocating more income to spending and less or none to saving) or, as is often the case, drawing on past savings
      - b) increasing new borrowings (i.e., not changing the allocation of income to spending and saving but increasing the spending financed by new borrowings)
  - 1) and 2) have impacts on aggregate spending (income) – however, the magnitude and timing of their impact differs
    - 1) would result in a further reduction in *current* spending, where the current impact could be large or small, but its future impact would be negligible if future spending financed by new financial injections was quickly restored to levels sufficient to enable the currency-using sector to finance its desires and meet its tax obligations

# Features of modern money

- Some interesting things then began to emerge, many undesirable
- 7) Financial systems are now subject to instability – spending collapses within the currency-using sector become a possibility
    - 2) would prevent a further reduction in *current* spending and, if continued, would temporarily keep aggregate spending buoyant – however, spending by the currency-using sector would eventually collapse because:
        - If a) continues to occur, the currency-using sector will eventually exhaust its past savings
        - If b) continues to occur, the currency-using sector will eventually have to allocate more income to saving and less to spending to pay off its growing debt. Worse still, the debt will eventually balloon to unserviceable levels
- What is most likely? 1) or 2)?
- People dislike losses of a particular value many times more than they like gains of the same value (Kahneman) – people often do what is necessary to avoid losses in the present
- When confronted with losses, people have a propensity to draw on past savings or borrow more than they planned to maintain accustomed spending levels
- Hence, 2) is most likely, as evidence indicates – thus, initially, when governments cut spending:
    - private sector savings rates decline
    - private sector debt-to-income ratios rise

# Features of modern money

- Some interesting things then began to emerge, many undesirable
- 7) Financial systems are now subject to instability – spending collapses within the currency-using sector become a possibility
  - The Global Financial Crisis (GFC) of 2008-2009 was a classic example
  - For years, currency-issuing central governments cut spending (a fall in financial injections) in an effort to run budget 'surpluses' (unnecessary because currency-issuers have no financial constraint)
  - Without any counteracting rise in financial injections, total spending (GDP) is less than it would otherwise be, which reduces the income of the currency-using sector and forces it to choose between options 1), 2a), and 2b)
  - During the lead up to the GFC, the currency-using sector opted for 2b) – it preserved accustomed spending levels by borrowing more (financial injections) to maintain its spending desires. In doing so, it counteracted the deduction in financial injections caused by the fall in government spending
  - Option 2b) kept aggregate spending within the economy (GDP) buoyant, which kept unemployment rates low and the tax receipts (more accurately, the destruction of the currency-using sector's spending power) high
  - The latter, together with the cut in government spending, enabled the currency-issuer to achieve its budget surpluses (and beat its chest with delight!)
  - However, it forced the currency-using sector to accumulate more debt to finance its spending desires until it inevitably reached unserviceable levels – Note: the currency-issuer's surplus ('net fiscal drain') = the currency-using sector's deficit
  - In 2008, the spending by the currency-using sector collapsed, GDP fell sharply, and the financial systems of many nations went into meltdown

# Summary

- **Given the many undesirable features of modern money, should we abandon it? No. Modern money is one of humankind's greatest inventions – a modern, complex, sophisticated economy filled with high quality and accessible public goods could not function without it**
- **Features of modern money**
  - **Unit of account (sole feature of pre-modern money)**
  - **Together with taxation, modern money is a means of transferring real resources from the private sector to the public sector in an effective and non-inflationary manner – vital because some highly desired goods and services have peculiar features (public goods) which, if left to the private sector, result in their insufficient provision (Note: the provision of public goods is inherently unprofitable – the earning of profits is not required, and therefore not an obstacle, for a currency-issuing central government) – *this feature of modern money goes unrecognised by mainstream economists*!**
  - **Medium of exchange – arose (as did markets) following the initial injection of modern money by a currency-issuing authority into economic systems**
  - **Store of nominal exchange value**
  - **Spending time machine**
    - **Allows people to delay spending (save); bring spending forward (borrow)**
    - **Affects the timing of the mobilisation of resources – saving delays the mobilisation of resources; borrowing brings the mobilisation forward**
    - **Led to financial injections (private sector spending financed by advances; govt spending; exports), and financial leakages (saving, taxes, imports)**

# Summary

- **Nonetheless, we do need to deal with the many undesirable aspects of modern money and the consequences arising from its misuse**
  - **A currency-issuing central government needs to almost always deficit-spend to:**
    - **achieve full employment (i.e., expand the public sector, if required, to maintain full employment) – a Job Guarantee should only be invoked (job provided at the minimum wage) when the NAIRU is reached (see last slide); until the NAIRU is reached, a CICG can hire unemployed people at award wages without it causing inflation**
    - **supply much needed and desired public goods**
    - **enable currency-users to net save (the currency-issuer's deficit = currency-user's surplus), which is a necessary ingredient of a stable financial system**
    - **Note: CICGs face no fiscal constraint to prevent the above – they only face real resource constraints**
  - **Progressive taxation is required to overcome gross income and wealth inequalities made possible by modern money and modern markets – taxation/charges should be used to confiscate economic rents and deter 'bads' (e.g., pollution)**
  - **Governments need to better regulate finance, perhaps even ban some designer financial assets and speculative trading of fundamental assets (e.g., property and foodstuffs)**
  - **Governments should certainly confiscate the unearned financial gains generated by the creation and circulation of such assets – this is because unearned financial gains are inequitable; in addition, this type of activity distorts investment and increases the fragility of the financial system**

# Summary

- **Nonetheless, we do need to deal with the many undesirable aspects of modern money and the consequences arising from its misuse**
  - **Fiscal measures should be used, not interest rates, to control inflation**
    - **Almost all contemporary inflationary episodes have a supply-side (not demand-side) origin**
    - **Interest rates have little impact on spending (aggregate demand) – they have largely distributional effects (one person's interest payment is another person's interest income)**
    - **If anything, higher interest rates stoke inflation because: (a) interest rates increase business funding costs; (b) a feature of modern markets at the economy's secondary trophic level (resource-refining and processing, manufacturing, and material waste recovery industries) and tertiary trophic level (service industries) is the price 'setting' not price 'taking' behaviour of businesses; (c) price setting entails businesses marking up above costs; and (d) higher costs lead to higher prices**
    - **Thus, higher interest rates lead to higher prices. It is intriguing that central bankers often plead with workers to not seek excessively higher wages (an increased business cost) in the belief that it will stoke inflation, yet hike interest rates (an increased business cost) in the belief that it quells inflation**
    - **If well designed, a Job Guarantee is not only an ideal institution to achieve and maintain full employment, it prevents demand-pull inflation because govt spending ceases to rise – to offset declines in non-govt spending – the very moment that full employment (the economy's productive capacity) is reached (i.e., when unemployed people stop walking into JG offices)**

# Appendix 1 – The expenditure multiplier

- **The expenditure multiplier – a numerical example**
  - **GDP = Ā x expenditure multiplier, where:**
    - **Ā = financial injections spent on domestically-produced goods and services (Note: all spending is initiated by a financial injection)**
    - **Exp multiplier = 1/(percentage of any additional spending (and therefore income) that leaks from the system)**
    - **Exp multiplier = 1/[1 – (*c* x (1 – *t*)(1 – *m*))], where:**
      - ***c* = marginal propensity to spend after-tax income on consumption goods**
      - **1 – *c* = marginal propensity to save (i.e., marginal propensity to refrain from spending after-tax income on consumption goods)**
      - ***t* = marginal tax rate (i.e., percentage of income destroyed by taxation)**
      - ***m* = marginal propensity to spend on imported goods**
    - **Let's assume the following:**
      - **Ā = $200 billion (i.e., there is $200 billion of spending on domestically-produced goods financed by newly-created base dollars, newly-created credit dollars, and the re-injection of past savings)**
      - ***t* = 25% = 0.25 (i.e., 25 cents of every dollar earnt leaks from the real economy in the form of taxation (drains out of the bathtub into the tax bin in the second-last slide))**
        - **∴ only 75 cents of every dollar earnt remains in the bathtub for spending/saving purposes**

# Appendix 1 – The expenditure multiplier

- **The expenditure multiplier – a numerical example**
  - **Let's assume the following:**
    - ***c*** **= 80% = 0.8 (i.e., 80 cents of every after-tax dollar is re-spent on consumption goods, thus remaining in the real economy and therefore continuing to circulate in the bathtub in the second-last slide)**
      - **∴ 60 of every 75 cents of every after-tax dollar is spent on consumption goods**
    - **1 –** ***c*** **= 20% = (1 – 0.8) = 0.2 (i.e., 20 cents of every after-tax dollar leaks from the real economy in the form of savings and is therefore syphoned into the vault in the second-last slide)**
      - **∴ 15 of every 75 cents of every after-tax dollar is saved**
    - ***m*** **= 16.7% = 0.167 (i.e., 16.7 cents of every after-tax dollar devoted to spending on consumption goods is spent on imported goods and is therefore syphoned to the ROW in the second-last slide)**
      - **∴ 10 of every 60 cents spent on consumption goods is devoted to spending on foreign-produced goods (imports)**
      - **∴ 50 of every 60 cents spent on consumption goods is devoted to spending on domestically-produced goods**
    - ***In the end, only 50 cents of every dollar earnt is re-spent on domestically-produced goods*** **(i.e., remains in the bathtub in the second-last slide) – the other 50 cents leaks from the real economy in form of taxation (25 cents into the tax bin), savings (15 cents into the vault), and import spending (10 cents to the ROW)**

# Appendix 1 – The expenditure multiplier

- **The expenditure multiplier – a numerical example**
  - The 50 cents of spending on domestically-produced goods generates another 50 cents of income, of which 25 cents leaks from the real economy in the form of taxation, savings, and import spending – the remaining 25 cents is re-spent on domestically-produced goods, thus generating another round of income and spending
  - The process continues until the additional income and spending declines to zero
  - The order-of-magnitude increase in total spending (GDP) depends on the value of the expenditure multiplier
  - Exp multiplier = $1/[1 - (c \times (1 - t)(1 - m))]$

    $= 1/[1 - (0.8 \times (1 - 0.25)(1 - 0.167))]$

    $= 1/[1 - (0.8 \times 0.75) \times (0.833)]$

    $= 1/[0.6 \times 0.833]$

    $= 1/[0.5] = 2$
  - GDP = $\bar{A}$ x exp multiplier = $200 billion x 2 = $400 billion
  - This means that there is:
    - $200 billion of initial spending financed by financial injections
    - a further $200 billion of subsequent spending (the expenditure multiplier process)
    - a total of $200 billion of leakages in the form of taxation ($100b = 0.25 x $400b; savings ($60b = 0.2 x [$400b – $100b]); and import spending ($40b = 0.167 x [$300b – $60b])

# Appendix 1 – The expenditure multiplier

- **The expenditure multiplier – a numerical example**
  - **In terms of sectoral balances (slide # 14):**
    - **(G – T) = (S – I) – (X – M)**
    - **If the financial injection of $200 billion is comprised entirely of spending by the currency-issuing central government (G), then:**
      - **($200b – $100b) = ($60b – $0) – ($0 – $40b)**
      - **$100b = $60b + $40b**
    - **G – T (net fiscal injection) = $200 billion – $100 billion = $100 billion**
    - **S – I (net savings of the domestic currency-using sector) = $60 billion**
    - **X – M = (external balance) = -$40 billion**
    - **This means the $200 billion of CICG spending has financed:**
      - **$100 billion of tax payments**
      - **$60 billion of private-sector net savings**
      - **$40 billion of private-sector import spending**

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# Appendix 2 – On interest rates to control inflation

- **When central banks raise interest rates to control inflation, they do so believing the following:**
  - **The inflation they are attempting to curb is of the *demand-pull* type – i.e., is caused by aggregate demand (spending on new domestically-produced goods and services) exceeding the nation's productive capacity**
  - **Higher interest rates reduce aggregate demand**
  - **Overall, ↑ interest rates, ↓ aggregate demand, ↓ inflation**
- **Problem with this approach:**
  - **1) Almost all increases in the inflation rate are of the so-called *cost-push* variety (supply-side) – i.e., are caused when either:**
    - **domestic productive capacity collapses (e.g., by war, civil unrest, natural disaster, human-induced ecological collapse, transference of productive assets to citizens unable to use the assets to their full productive capacity)**
    - **supply-chain constraints – i.e., not from reduced productive capacity, but from difficulty in mobilising productive resources (e.g., internal lock-downs during a pandemic and external factors that reduce key resource imports)**
    - **price increases of a critical productive input (e.g., the oil price hikes of the 1970s)**
    - **mismatches of the demand for productive inputs and the supply (availability) of productive inputs – Note: mismatches of the demand for, and the availability of, labour skills result in the NAIRU (inevitable, to some degree)**

# Appendix 2 – On interest rates to control inflation

- **Problem with this approach:**
  - **2) Higher interest rates do not reduce aggregate demand**
    - **It is believed that higher interest rates reduce aggregate demand by:**
      - **a) increasing the cost of new borrowing, which reduces the spending financed by new advances (usually referred to as loans)**
      - **b) increasing interest payments on existing advances, which reduces the spending power of borrowers**
    - **Problem with this belief:**
      - **Firstly, b) has distributional effects – yes, interest payments on advances reduce the spending power of borrowers; but interest payments increase the spending power of bank shareholders and owners of interest-bearing assets (one person's interest payment is another person's interest income)**
      - **Secondly, a) results in spenders adjusting the way they finance their spending – they increase the proportion of new spending financed by disposable income and/or by drawings from past saving and reduce the proportion of new spending financed by new advances to minimise the rise in financing costs caused by rising interest rates**
      - **In response:**
        - **businesses pass on any rise in business financing costs in the form of higher prices**

# Appendix 2 – On interest rates to control inflation

- **Problem with this approach:**
  - **2) Higher interest rates do not reduce aggregate demand**
    - **In response:**
      - **workers seek higher wages in response to any rise in the cost to finance consumer spending**
      - **The passing on of costs (higher prices) and the seeking of higher wages is part-and-parcel of the dynamic inflation process – i.e., owners of the factors of production seek to maintain their relative share of all financial claims on real wealth**
      - **So long as the process leaves real spending levels unchanged, *aggregate demand is not affected*, albeit the rate of price inflation will have risen**
      - **Exceptions (i.e., reductions in aggregate demand) may include:**
        - **reductions in net exports should net exports be sensitive to a real exchange rate appreciation caused by the rise in the domestic inflation rate ($R = e.\ Pf^*/P^*$), where $R$ = real exchange rate; $e$ = nominal exchange rate; $Pf^*$ = foreign inflation rate; $P^*$ = domestic inflation rate**
        - **reductions in consumer and business sentiment/confidence arising from a higher rate of price inflation**

# Appendix 3 – Myths about govt budget deficits

- **About the budget of a currency-issuing central government (CICG)**
  - **The budget bottom line of a CICG is usually referred to as the difference between CICG spending (G) and CICG tax revenue (T)**
  - **CICG budget bottom line = G – T (where G > T is a 'deficit'; G < T is a 'surplus')**
    - **Note: Since a CICG does not need to tax currency-users to finance its spending, T is more accurately a measure of destroyed currency-users' spending power (it is not a form of revenue to be respent/recycled)**
    - **T = permanently destroyed spending power of currency-users**
  - **G is a financial injection of newly-created base money**
    - **Every dollar of G is a 'new' base dollar that is spent into the economy by a CICG (the majority of which is created by a central bank through computer keystrokes) – base money is created as it is spent into the economy**
  - **T is a financial leakage of previously injected base money**
    - **Every dollar of T is an 'existing' base dollar that permanently exits the economy through CICG taxation (the majority of which is destroyed by a central bank through computer keystrokes)**
  - **If G > T, more base money is injected by CICG spending than is destroyed/drained through taxation – this constitutes a 'net fiscal injection'**
  - **If G < T, more base money is destroyed/drained through taxation than is injected by CICG spending – this constitutes a 'net fiscal drain'**

# Appendix 3 – Myths about govt budget deficits

- **1. CICGs do not issue bonds to finance a CICG net fiscal injection**
  - **It is often said that the issue/sale of government bonds finances a CICG net fiscal injection (falsely referred to as a CICG budget deficit, as we have seen) – this is often referred to as the CICG 'borrowing' from the private sector to finance its budget shortfall (again, misleading)**
  - **A central bank issues bonds on behalf of the CICG to drain (temporarily remove) base money from the economy to achieve its interest rate targets**
    - **If G > T, excess base money resides in the reserve accounts of financial institutions, which places downward pressure on the interbank lending rate (the result of the net fiscal injection)**
    - **To defend its target interest rate, the central bank drains the excess base money by issuing bonds – there is simply a financial asset swap (base money for government bonds and vice versa)**
      - **The base money returns to the economy when the bonds mature**
      - **The base money temporarily removed by the sale of the bonds is the same base money that the CICG has previously injected into the economy through its own spending by way of computer keystrokes**
      - **The CICG is not borrowing base money**
    - **Government bonds are essentially central bank term/time deposits that can be traded on a secondary bond market (therefore different to term/time deposits held at a private bank)**
    - **The interest paid by central banks to bond holders is a fiscal injection financed the same way as CICG spending (through computer keystrokes)**

# Appendix 3 – Myths about govt budget deficits

- **2. The bonds held by the private sector are not the National Debt**
  - **We've all seen them, if only on a TV screen – National Debt clocks climbing at an alarming rate displaying how much every man, woman, and child owes because of CICG deficit spending**
  - **What is referred to as the National Debt (again, misleading) is the accumulated value of the government bonds held by the private sector**
  - **We have seen that bonds are essentially issued in response to CICG net fiscal injections to enable the central bank to set and defend its target interest rate**
  - **The accumulated value of outstanding government bonds is not 'debt' at all (Recall: a debt is a liability that, to be extinguished, requires the debtor to give up something real and useful)**
    - **On behalf of the CICG, the central bank returns the base money (plus interest) to the bond holder when the bond matures**
    - **The returned base money is the same base money originally injected into the economy through CICG spending that was created through computer keystrokes (nothing real and useful is surrendered by the CICG)**
  - **As the accumulated value of the government bonds held by the private sector, the falsely termed National Debt is in fact the portion of the private sector's savings held in the form of CICG-guaranteed interest-bearing financial assets – this is not something to be concerned about**

# Appendix 3 – Myths about govt budget deficits

- **3. Net fiscal injections don't reduce a CICG's ability to spend**
  - **A central/national government has no financial (spending) constraint if:**
    - **it issues its own currency**
    - **the currency it issues is not made of an exhaustible material (e.g., gold)**
      - **Most base money is nowadays created by central banks with computer keystrokes, so this constraint is irrelevant**
      - **Before computers, most base money was created when central banks issued cheques – the amount of base money created was determined by the number of dollars written/typed/printed on issued cheques, so this constraint has long been irrelevant**
    - **what the CICG wishes to purchase is for sale in its own currency**
      - **The Australian Federal Government does not have unlimited capacity to purchase things for sale in Japanese Yen**
      - **The Australian Federal Government can purchase things denominated in Japanese Yen by creating Australian dollars and exchanging them for Yen, but should it go too far, it risks devaluing the Australian dollar, in which case the money creation-exchange exercise becomes self-cancelling, although it will harm domestic currency-users since they are unable to create Australian dollars to offset the devaluation**
    - **it has no liabilities denominated in a foreign currency (most CICGs around the world are in this position)**

# Appendix 3 – Myths about govt budget deficits

- **3. Net fiscal injections don't reduce a CICG's ability to spend**
  - **A central/national government has no financial (spending) constraint if:**
    - **it operates a flexible exchange rate – that is, it does not peg its currency to a foreign currency (very few countries operate a fixed exchange rate)**
    - **it does not impose an institutional (artificial) spending constraint upon itself (e.g., a senseless debt ceiling)**
      - **The US Government sometimes gets into spending trouble when it runs up against a self-imposed debt ceiling**
      - **The US Government alleviates its spending difficulties the moment the debt ceiling is raised, thus indicating that it confronts no natural spending constraint**
  - **The following are not CICGs – they are currency-using governments:**
    - **State/Provincial Governments**
    - **Local Governments**
    - **European Union Governments, which stupidly (possibly unknowingly, given the lack of understanding of Modern Money) relegated themselves to currency-using status (users of the Euro, which is a regional currency)**
  - **Because a CICG has no spending constraint, a net fiscal injection (budget deficit) does not reduce its ability to spend; nor does a net fiscal drain (budget surplus) increase its ability to spend ($\infty - X = \infty$; $\infty + X = \infty$)**

# Appendix 3 – Myths about govt budget deficits

- **4. Net fiscal injections are not necessarily expansionary**
  - **There is a general belief that a CICG 'budget deficit' is always expansionary/ stimulatory in the sense that it increases Aggregate Expenditure and therefore increases the nation's GDP**
  - **First things first – a CICG has no control over the size and nature of its budget bottom line**
  - **A CICG has quite a lot of control over its spending (G), although some of its spending varies as economic circumstances fluctuate – examples include:**
    - **Increasing dole payments when unemployment rises**
    - **Increasing G when CICGs respond to a natural disaster**
  - **A CICG has little control over the quantity of base money it destroys through taxation (T)**
    - **A large share of T is positively related to GDP (GDP ↑, T ↑; GDP ↓, T ↓)**
    - **GDP = C + I + G + X – M, where:**
      - **C = private-sector consumption expenditure**
      - **I = private-sector investment spending (spending on capital goods)**
      - **G = government consumption and investment spending**
      - **X = foreign spending on domestically-produced goods (exports)**
      - **M = domestic spending on foreign-produced goods (imports)**

# Appendix 3 – Myths about govt budget deficits

- **4. Net fiscal injections are not necessarily expansionary**
  - **A CICG has little control over the quantity of base money it destroys through taxation (T)**
    - **Should any one of the components of GDP dramatically rise/fall, it can dramatically affect GDP, and therefore T**
    - **Note: One of the components of GDP is government spending (G)**
      - **If a CICG reduces G to reduce its budget deficit, it will reduce GDP and therefore T, which means any decrease in the budget deficit will be smaller than the decrease in G**
      - **The overall impact on the budget bottom line depends on the magnitude of the changes in G and T (i.e., depends on the dynamics associated with sectoral balances referred to in slide # 14)**
    - **Another GDP-influencing factor is private-sector consumption spending (C)**
      - **Case 1: If the private sector devotes a smaller share of each dollar it earns to C (i.e., reduces its marginal propensity to spend after-tax income on consumption goods) in order to devote a larger share of each dollar it earns to S, this will reduce GDP by reducing the size of the expenditure multiplier (see slide # 31)**
      - **Paradox of Thrift (PofT)**
        - **It turns out that as the private sector reduces C to increase S, its after-tax income falls (as GDP falls)**

# Appendix 3 – Myths about govt budget deficits

- 4. Net fiscal injections are not necessarily expansionary
  - A CICG has little control over the quantity of base money it destroys through taxation (T)
    - Paradox of Thrift (PofT)
      - The private sector saves more of every dollar it earns, but it earns fewer dollars
      - The private sector ends up saving just as much as it did previously (i.e., S is unchanged)
      - The PofT highlights an important aspect of the dynamics of sectoral balances – the private-sector cannot increase its net savings (a financial leakage) unless its increasing desire to save is accommodated by a larger net fiscal injection by the CICG (a financial injection)
    - Case 2: Sometimes the private sector opts to achieve a savings target by reducing discretionary spending to whatever level is required to achieve the savings target rather than alter the share of each dollar of after-tax income devoted to C and S respectively
      - This time, the expenditure multiplier is unchanged
      - However:
        - $\bar{A}$ falls (as C falls in order to achieve a specific S target)
        - GDP declines

# Appendix 3 – Myths about govt budget deficits

- **4. Net fiscal injections are not necessarily expansionary**
  - **Overall:**
    - **The private sector achieves its savings target**
    - **The decline in GDP leads to a fall in T**
    - **The CICG's budget moves into deficit – the deficit is driven entirely by the increasing desire of the private sector to increase its net savings**
    - **The CICG's budget deficit (net fiscal injection) accommodates the net savings desires of the private sector, *whether the CICG likes it or not***
      - **Important: The net fiscal injection is not the result of a change in G, but a fall in T – it is the reduction in the private-sector spending power destroyed by taxation that has allowed the private sector to net save**
      - **The net fiscal injection is not stimulatory (Aggregate Expenditure and GDP have, in fact, fallen)**
      - ***The CICG's budget bottom line is ultimately determined by the private sector's net savings desires – it drives the CICG's budget bottom line***
        - **If the private sector is determined to operate a surplus, the CICG runs a budget deficit, *whether the CICG likes it or not***
        - **If the private sector is prepared to operate a deficit, the CICG runs a budget surplus, *whether the CICG likes it or not***
      - **Note: CICGs often run deficits when GDP is depressed and surpluses when GDP is buoyant – fluctuations in the CICG's budget bottom line are almost always due to fluctuations in T, not G**

# Appendix 4 – Fractional reserve banking is a myth

- **Fractional reserve banking (FRB) is a key element of the money-creation story found in mainstream economic textbooks – it is another mainstream myth (a misrepresentation of our financial systems)**
  - **FRB falsely assumes that banks (non-govt financial institutions):**
    - **'lend' depositors savings to borrowers**
    - **act as financial intermediaries between savers and 'lenders'**
    - **are required to maintain a specified percentage of depositors' savings as 'reserves' in a reserve account held at the central bank, which limits the quantity of money that banks can lend to borrowers**
  - **Thus, FRB falsely assumes that:**
    - **deposits (savings) create loans – hence, it falsely assumes that depositors' savings finance the spending of borrowers (especially investment spending)**
    - **lending to borrowers (money creation by banks) is 'reserve constrained'**
    - **the money supply = CICG base money x the money multiplier (where the money multiplier = 1/(reserve-deposit ratio))**
      - **Important point: The reserve-deposit ratio is not the same as the capital-adequacy ratio – the latter is a requirement of banks to ensure they have sufficient capital to cover their risk-weighted assets**

# Appendix 4 – Fractional reserve banking is a myth

- **Fractional reserve banking (FRB) is a key element of the money-creation story found in mainstream economic textbooks – it is another mainstream myth (a misrepresentation of our financial systems)**
  - **Thus, FRB falsely assumes that:**
    - **the money supply is exogenously determined by the central bank, which can control the quantity of money (set and achieve money supply targets) by altering:**
      - **the quantity of base money**
      - **the reserve-deposit ratio**
  - **Numerical example of the mythical money supply formula:**
    - **Base money = $100 billion**
    - **Reserve-deposit ratio = 20% (i.e., 20% of depositors' savings must be held in a reserve account at the central bank)**
    - **Money multiplier = 1/0.2 = 5**
    - **Money supply = $100 billion x 5 = $500 billion;**
    - **Bank-created credit money = $400 billion = $500 billion – $100 billion of base money**

# Appendix 4 – Fractional reserve banking is a myth

- **Fractional reserve banking (FRB) is a key element of the money-creation story found in mainstream economic textbooks – it is another mainstream myth (a misrepresentation of our financial systems)**
  - **The mythical money supply story goes like this:**
    - **A CICG creates $1,000 of base money to employ and pay person A**
    - **The $1,000 of CICG spending (G), which increases the quantity of base money by $1,000, ultimately appears in person A's bank account as a $1,000 cash deposit**
    - **With a reserve-deposit ratio of 20%, the bank must leave $200 in the reserve account it holds with the central bank – this leaves $800 to 'lend' to borrowers**
    - **The bank lends $800 to a new borrower**
    - **The borrower spends the $800, which becomes an $800 deposit in the bank account of the receiver of the cash payment**
    - **The bank must leave $160 in the reserve account it holds with the central bank – this leaves $640 to 'lend' to borrowers**
    - **The bank lends $640 to a new borrower**
    - **The borrower spends the $640, which becomes an $640 deposit in the bank account of the receiver of the cash payment**
    - **The bank must leave $128 in the reserve account it holds with the central bank – this leaves $512 to 'lend' to borrowers**

# Appendix 4 – Fractional reserve banking is a myth

- **Fractional reserve banking (FRB) is a key element of the money-creation story found in mainstream economic textbooks – it is another mainstream myth (a misrepresentation of our financial systems)**
  - **The mythical money supply story goes like this:**
    - **And so on, until the amount available to lend to new borrowers declines to zero – at this point, the money 'creation' process ceases**
    - **When this happens, the total of all money created by the process = $4,000**
    - **The increase of $1,000 of base money – i.e., the initial CICG spending – has increased the money supply by $5,000 = $1,000 (base money) + $4,000 (credit money)**
    - **This is nonsense! (more soon)**
      - **Banks create credit money with computer keystrokes**
      - **Banks don't 'lend' depositors' savings**
      - **Bank creation of credit money is not reserve-constrained**
    - **Even if banks did lend depositors' savings, the so-called money available for lending (i.e., the depositors' savings not held in reserve accounts) will only be 'lent' to borrowers if banks can find sufficient credit-worthy borrowers**
    - **The mythical money creation story assumes that *all* money available for lending will be lent**

# Appendix 4 – Fractional reserve banking is a myth

- **Fractional reserve banking (FRB) is a key element of the money-creation story found in mainstream economic textbooks – it is another mainstream myth (a misrepresentation of our financial systems)**
  - **Mythical money supply change (1): The central bank buys $10 billion of government bonds previously sold to the private sector to increase base money to $110 billion**
    - **The money supply rises to $550 billion = $110 billion x 5**
    - **Bank-created credit money increases to $440 billion**
    - **An extra $40 billion of credit money is available to stimulate private-sector spending (nonsense!)**
    - **This is the false logic of 'Quantitative Easing' (QE) – the purchase of the bonds does not increase the money 'available for lending'; there is nothing but a financial asset swap (bonds for cash, and vice versa)**
  - **Mythical money supply change (2): The central bank increases the reserve-deposit ratio to 25%**
    - **The money multiplier falls to 4 = 1/0.25**
    - **The money supply decreases to $400 billion = $100 billion x 4**
- **Whilst some central banks do impose reserve ratio requirements on private banks, this does not limit the ability of banks to create credit money (as we shall see)**

# Appendix 4 – Fractional reserve banking is a myth

- **Fractional reserve banking (FRB) is a key element of the money-creation story found in mainstream economic textbooks – it is another mainstream myth (a misrepresentation of our financial systems)**
  - **How do banks create credit money?**
  - **Once a bank is confident that a borrower is sufficiently credit-worthy, it creates credit money – which it advances to the borrower – through computer keystrokes**
    - **No existing money is 'lent' to the borrower**
    - **The money advanced to the borrower is not depositors' savings – the credit money created by the bank are brand-new dollars**
  - **The bank credits the borrower's bank account (a new or existing account)**
    - **The borrower's balance sheet expands**
      - **The borrower's financial assets (FA) increase (the borrower has more cash to draw upon for spending purposes)**
      - **The borrower's financial liabilities (FL) increase**
        - **1) The principal of the advance must be repaid by the borrower (Note: the credit money is destroyed, and the borrower's liabilities decline, as the principal is repaid)**
        - **2) The borrower will have interest liabilities to pay to the bank (Note: the borrower's liabilities decline as the interest is paid, but credit money is not destroyed – there is simply a financial asset swap between the borrower and the bank (hence, unlike principal repayments, interest payments have distributional effects))**

# Appendix 4 – Fractional reserve banking is a myth

- **Fractional reserve banking (FRB) is a key element of the money-creation story found in mainstream economic textbooks – it is another mainstream myth (a misrepresentation of our financial systems)**
  - **The bank credits the borrower's bank account (a new or existing account)**
    - **The bank's balance sheet expands**
      - **The bank's financial assets (FA) increase:**
        - **1) The principal of the advance must be repaid by the borrower**
        - **2) The borrower owes the bank interest over the term of the advance**
      - **The bank's financial liabilities (FL) increase (the borrower can now draw upon the advanced credit money, which appears in the borrower's bank account, for spending purposes)**
  - **The combined net financial assets of the bank and the borrower are unchanged (NFA = FA – FL), although the net financial assets of the bank have increased (interest owed by borrower) and have decreased for the borrower (interest owed to the bank) – the interest constitutes a source of income for the bank**
  - **Only CICGs can create net financial assets, which is what they do when they net-spend, and why CICG net spending (G > T) is able to accommodate the net savings desires of the private sector (S > I)**
  - **That is, G > T increases the net financial assets of the private sector – Note: savings created by CICG spending are 'hard' savings because they are permanent until and if they are destroyed by taxation**

# Appendix 4 – Fractional reserve banking is a myth

- **Fractional reserve banking (FRB) is a key element of the money-creation story found in mainstream economic textbooks – it is another mainstream myth (a misrepresentation of our financial systems)**
  - **Although the central bank can decrease the quantity of base money in the system by selling government bonds (reduces base money) and increase the quantity of base money in the system by buying back government bonds (increases base money by returning some of the base money it previously drained from the system), it cannot achieve specific money supply targets**
  - **This is because central banks cannot precisely control the quantity of credit money that banks can create**
  - **Evidence?**
    - **When 'monetarism' became the new vogue in the late-1970s, central banks gave up on achieving money supply targets because they were unachievable**
    - **Central banks switched to regulating interest rates as a (false) means of regulating aggregate expenditure (GDP)**
  - **Conclusion: The money supply is endogenously determined**

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# Appendix 5 – Reserve accounting

- **Reserve accounts of banks**
  - **Central banks do not deal directly with the private sector through the bank accounts of individuals and organisations – they deal *indirectly* with the private sector through the reserve accounts held by financial institutions**
  - **Central banks do this because:**
    - **they need to increase/decrease the quantity of base money in the system for various reasons, although this doesn't amount to altering the quantity of base money to achieve specific money supply targets (see slide # 54)**
    - **CICGs only deal in the base money they create (spend), destroy (tax), and temporarily remove from the system (the selling and buying of government bonds) – they do not deal in credit money (e.g., they do not accept credit money or the base money of another country as payment of taxes or payment for bond purchases)**
  - **Case 1: CICG spending (G) of $100 million on labour and goods & services appears as follows:**
    - **Central bank: $100 million increase in liabilities (not a debt! – see slide # 18)**
    - **Banks**
      - **Assets: $100 million of base money appears in the asset side of bank balance sheets (i.e., in their reserve accounts)**
      - **Liabilities: Bank customers (paid by the CICG for their labour and goods & services) can now draw upon $100 million of cash**
      - **Note: the net financial assets of banks are unchanged, although their balance sheets have expanded**

# Appendix 5 – Reserve accounting

- **Reserve accounts of banks**
  - **Case 1: CICG spending (G) of $100 million on labour, goods, and services appears as follows:**
    - **Bank customers (paid by the CICG for their labour and goods & services)**
      - **Assets: $100 million of cash is available for spending/savings purposes (i.e., appears in their bank accounts)**
      - **Liabilities: unchanged**
      - **Note: the net financial assets of bank customers have increased by $100 million (i.e., the CICG's net fiscal injection ('deficit') equals the private sector's surplus)**

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  - **Case 2: CICG taxation (T) of $50 million appears as follows:**
    - **Central bank: $50 million decrease in liabilities**
    - **Banks**
      - **Assets: $50 million of base money is deleted from the asset side of bank balance sheets (i.e., from their reserve accounts)**
      - **Liabilities: The cash that bank customers (i.e., those extinguishing their tax liabilities) can draw upon has declined by $50 million**
      - **Note: the net financial assets of banks are unchanged, although their balance sheets have contracted**

# Appendix 5 – Reserve accounting

- **Reserve accounts of banks**
  - **Case 2: CICG taxation (T) of $50 million appears as follows:**
    - **Bank customers (i.e., those extinguishing their tax liabilities)**
      - **Assets: $50 million of cash that was previously available for spending/savings purposes is deleted from their bank accounts**
      - **Liabilities: unchanged**
      - **Note: the net financial assets of bank customers have decreased by $50 million (i.e., the CICG's net fiscal drain ('surplus') equals the private sector's deficit)**

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  - **Case 3: Bank X creates $1,000 of credit money and advances it to person A who uses the credit money to extinguish a $1,000 tax liability**
    - **Firstly, the central bank on behalf of the CICG will not accept $1,000 of credit money as payment of taxes**
    - **Secondly, banks are granted a licence to create credit money on the condition that they convert it to base money as required – bank X must obtain $1,000 of base money to enable person A to extinguish her tax liability**

# Appendix 5 – Reserve accounting

- Reserve accounts of banks
  - Case 3: Bank X creates $1,000 of credit money and advances it to person A who uses the credit money to extinguish a $1,000 tax liability
    - There are two phases to consider here:
    - 1. The advancing of $1,000 of credit money by bank X to person A
    - Bank X
      - Assets:
        - The $1,000 advance that must be repaid by person A
        - The interest person A owes over the term of the advance
      - Liabilities:
        - The $1,000 cash that person A can draw upon
    - Person A
      - Assets:
        - The $1,000 cash that person A can draw upon (which appears in person A's bank account)
      - Liabilities:
        - The $1,000 advance owed to Bank X
        - The interest owed to bank X over the term of the advance

# Appendix 5 – Reserve accounting

- Reserve accounts of banks
  - Case 3: Bank X creates $1,000 of credit money and advances it to person A who uses the credit money to extinguish a $1,000 tax liability
    - There are two phases to consider here:
    - **2. The use of the $1,000 of credit money by person A to extinguish her tax liability**
    - ***2a. Should bank X already have at least $1,000 of base money residing in its reserve account*** **(perhaps due to a past net fiscal injection by the CICG), then bank X will simply transfer $1,000 of base money to the central bank. The effects of this are:**
    - **Central bank: $1,000 decrease in liabilities**
    - **Bank X**
      - **Assets: $1,000 of base money is deleted from the asset side of bank X's balance sheet (i.e., from its reserve account)**
      - **Note: The assets created by the advance have not disappeared. That is:**
        - **Person A must still repay the $1,000 advanced by bank X**
        - **Person A still owes interest to bank X over the term of the advance**
      - **Liabilities: The cash that person A can draw upon has declined by $1,000**

# Appendix 5 – Reserve accounting

- **Reserve accounts of banks**
  - **Case 3: Bank X creates $1,000 of credit money and advances it to person A who uses the credit money to extinguish a $1,000 tax liability**
    - **There are two phases to consider here:**
    - **2. The use of the $1,000 of credit money by person A to extinguish their tax liability**
    - ***2a. Should bank X already have at least $1,000 of base money residing in its reserve account*** **(perhaps due to a past net fiscal injection by the CICG), then bank X will simply transfer $1,000 of base money to the central bank. The effects of this are:**
    - **Person A**
      - **Assets: $1,000 of cash that was previously available for spending/savings/tax-extinguishing purposes is deleted from person A's bank account**
      - **Liabilities: unchanged**
      - **Note: The liabilities created by the advance have not disappeared. That is:**
        - **Person A must still repay the $1,000 advanced by bank X**
        - **Person A still owes interest to bank X over the term of the advance**

# Appendix 5 – Reserve accounting

- Reserve accounts of banks
  - Case 3: Bank X creates $1,000 of credit money and advances it to person A who uses the credit money to extinguish a $1,000 tax liability
    - There are two phases to consider here:
    - 2. The use of the $1,000 of credit money by person A to extinguish their tax liability
    - *2b. Should $1,000 of base money not reside in bank X's reserve account,* then bank X must obtain $1,000 of base money to enable person A to extinguish her tax liability. There are two ways bank X can obtain $1,000 of base money:
    - 1) It can borrow $1,000 of base money from a bank (say, bank Y) possessing $1,000 of excess/surplus base money – the base money is borrowed at the short-term inter-bank lending rate (the 'cash' rate in Australia; the Fed 'funds' rate in the USA; it is the interest rate you hear on a TV finance report)
    - Bank X
      - Assets: $1,000 of base money is added to the asset side of bank X's balance sheet (i.e., to its reserve account)
      - Liabilities:
        - Bank X owes bank Y $1,000 of base money
        - Bank X owes bank Y interest on the outstanding $1,000 of base money (borrowing cost to bank X; interest income for bank Y)

# Appendix 5 – Reserve accounting

- **Reserve accounts of banks**
  - **Case 3: Bank X creates $1,000 of credit money and advances it to person A who uses the credit money to extinguish a $1,000 tax liability**
    - **There are two phases to consider here:**
    - **2. The use of the $1,000 of credit money by person A to extinguish their tax liability**
    - ***2b. Should $1,000 of base money not reside in bank X's reserve account,* then bank X must obtain $1,000 of base money to enable person A to extinguish her tax liability. There are two ways bank X can obtain $1,000 of base money:**
    - **1) It can borrow $1,000 of base money from a bank (say, bank Y) possessing $1,000 of excess/surplus base money – the base money is borrowed at the short-term inter-bank lending rate (the 'cash' rate in Australia; the Fed 'funds' rate in the USA; it is the interest rate you hear on a TV finance report)**
    - **Bank Y**
      - **Assets:**
        - **$1,000 of base money is deleted from the asset side of bank Y's balance sheet (i.e., from its reserve account)**
        - **Bank X owes bank Y $1,000 of base money**
        - **Bank X owes bank Y interest on the outstanding $1,000 of base money (borrowing cost to bank X; interest income for bank Y)**
      - **Liabilities are unchanged**

# Appendix 5 – Reserve accounting

- **Reserve accounts of banks**
  - **Case 3: Bank X creates $1,000 of credit money and advances it to person A who uses the credit money to extinguish a $1,000 tax liability**
    - **There are two phases to consider here:**
    - **2. The use of the $1,000 of credit money by person A to extinguish their tax liability**
    - ***2b. Should $1,000 of base money not reside in bank X's reserve account,* then bank X must obtain $1,000 of base money to enable person A to extinguish her tax liability. There are two ways bank X can obtain $1,000 of base money:**
    - **1) It can borrow $1,000 of base money from a bank (say, bank Y) possessing $1,000 of excess/surplus base money – the base money is borrowed at the short-term inter-bank lending rate (the 'cash' rate in Australia; the Fed 'funds' rate in the USA; it is the interest rate you hear on a TV finance report)**
    - **Person A now extinguishes her tax liability – The subsequent changes in the assets and liabilities of the central bank, bank X, and person A are the same as Case 2 except $1,000 of base money is transferred, not $50 million**
    - **Note: It is worthwhile for bank X to advance $1,000 to person A because bank X will be charging a higher interest rate on the advance than it will be paying bank Y to borrow $1,000 of base money – hence, it will still make a profit**

# Appendix 5 – Reserve accounting

- **Reserve accounts of banks**
  - **Case 3: Bank X creates $1,000 of credit money and advances it to person A who uses the credit money to extinguish a $1,000 tax liability**
    - **There are two phases to consider here:**
    - **2. The use of the $1,000 of credit money by person A to extinguish their tax liability**
    - ***2b. Should $1,000 of base money not reside in bank X's reserve account,* then bank X must obtain $1,000 of base money to enable person A to extinguish her tax liability. There are two ways bank X can obtain $1,000 of base money:**
    - **2) If there is no bank with surplus base money to lend to bank X, bank X can always borrow $1,000 of base money from the central bank (lender-of-last-resort) – in Australia, the base money is borrowed at 0.25% above the inter-bank lending rate (the 'cash' rate in Australia) (Note: because the inter-bank lending rate is lower, a bank will always prefer to borrow from a bank with surplus base money than from the central bank)**
    - **Central bank:**
      - **Assets:**
        - **$1,000 of base money is owed by bank X**
        - **Bank X owes interest on the outstanding base money it owes the central bank**
      - **Liabilities:**
        - **$1,000 decrease in liabilities**

# Appendix 5 – Reserve accounting

- **Reserve accounts of banks**
  - **Case 3: Bank X creates $1,000 of credit money and advances it to person A who uses the credit money to extinguish a $1,000 tax liability**
    - **There are two phases to consider here:**
    - **2. The use of the $1,000 of credit money by person A to extinguish their tax liability**
    - ***2b. Should $1,000 of base money not reside in bank X's reserve account,* then bank X must obtain $1,000 of base money to enable person A to extinguish her tax liability. There are two ways bank X can obtain $1,000 of base money:**
    - **2) If there is no bank with surplus base money to lend to bank X, bank X can always borrow $1,000 of base money from the central bank (lender-of-last-resort) – in Australia, the base money is borrowed at 0.25% above the inter-bank lending rate (the 'cash' rate in Australia) (Note: because inter-bank lending rate is lower, a bank will always prefer to borrow from a bank with surplus base money than from the central bank)**
    - **Bank X**
      - **Assets: $1,000 of base money is added to the asset side of bank X's balance sheet (i.e., to its reserve account)**
      - **Liabilities:**
        - **Bank X owes the central bank $1,000 of base money**
        - **Bank X owes the central bank interest on the outstanding $1,000 of base money (borrowing cost to bank X)**

# Appendix 5 – Reserve accounting

- **Reserve accounts of banks**
  - **Case 3: Bank X creates $1,000 of credit money and advances it to person A who uses the credit money to extinguish a $1,000 tax liability**
    - **There are two phases to consider here:**
    - **2. The use of the $1,000 of credit money by person A to extinguish their tax liability**
    - ***2b. Should $1,000 of base money not reside in bank X's reserve account,* then bank X must obtain $1,000 of base money to enable person A to extinguish her tax liability. There are two ways bank X can obtain $1,000 of base money:**
    - **2) If there is no bank with surplus base money to lend to bank X, bank X can always borrow $1,000 of base money from the central bank (lender-of-last-resort) – in Australia, the base money is borrowed at 0.25% above the inter-bank lending rate (the 'cash' rate in Australia) (Note: because inter-bank lending rate is lower, a bank will always prefer to borrow from a bank with surplus base money than from the central bank)**
    - **Payment of the tax liability – The subsequent changes in the assets and liabilities of the central bank, bank X, and person A are the same as in Case 2 except $1,000 of base money is transferred, not $50 million**
    - **Note: By 'reserve requirements', one means the requirement of banks to ensure they have sufficient base money to enable the payment system to function – should banks have insufficient base money, they can always obtain it from the central bank; thus, banks advance money first, and sort out required base money (required reserves) later**

# Appendix 5 – Reserve accounting

- **Reserve accounts of banks**
  - **Case 4: Person A, who has a bank account with Bank X, uses a debit card linked to her bank account to purchase goods worth $500 from person B. The $500 has not been borrowed**
    - ***4a. Person B also has a bank account with Bank X.*** **The following occurs:**
    - **Central bank: Assets and liabilities are unchanged**
    - **Bank X**
      - **Assets and liabilities are unchanged**
      - **Note: There is no change in bank X's reserve account – there is no movement of base money; there is simply a transfer of $500 cash from person A's bank account to person B's bank account**
    - **Person A**
      - **Assets: $500 of cash is deleted from person A's bank account**
      - **Liabilities are unchanged**
    - **Person B**
      - **Assets: $500 of cash is added to person B's bank account**
      - **Liabilities are unchanged**

# Appendix 5 – Reserve accounting

- **Reserve accounts of banks**
  - **Case 4: Person A, who has a bank account with Bank X, uses a debit card linked to her bank account to purchase goods worth $500 from person B. The $500 has not been borrowed**
    - ***4b. Person B has a bank account with Bank Y.*** **The following occurs:**
    - **Central bank: Assets and liabilities are unchanged**
    - **Bank X**
      - **Assets: $500 of base money is deleted from the asset side of bank X's balance sheet (i.e., from bank X's reserve account)**
      - **Liabilities: The cash that person A can draw upon has declined by $500**
      - **Question: Why has $500 of base money been deleted from bank X's reserve account, and where has it gone?**
        - **The $500 of base money has been transferred to bank Y's reserve account**
        - **Why? Because person B – who banks with bank Y – may wish to use the $500 just received to extinguish a tax liability**
        - **This means bank Y would have to borrow base money (should it have insufficient excess base money in its reserve account to cover the tax payment), which would come at a cost to bank Y**
        - **Bank Y would gain nothing, but incur a cost**
        - **Hence, banks will only accept cash transfers from other banks if they are undertaken in the form of a transfer of base money**

# Appendix 5 – Reserve accounting

- **Reserve accounts of banks**
  - **Case 4: Person A, who has a bank account with Bank X, uses a debit card linked to her bank account to purchase goods worth $500 from person B. The $500 has not been borrowed**
    - ***4b. Person B has a bank account with Bank Y.*** **The following occurs:**
    - **Person A**
      - **Assets: $500 of cash is deleted from person A's bank account**
      - **Liabilities are unchanged**
    - **Bank Y**
      - **Assets: $500 of base money is added to the asset side of bank Y's balance sheet (i.e., to bank Y's reserve account)**
      - **Liabilities: The cash that person B can draw upon has increased by $500**
    - **Person B**
      - **Assets: $500 of cash is added to person B's bank account**
      - **Liabilities are unchanged**

# Appendix 5 – Reserve accounting

- **Reserve accounts of banks**
  - **Case 5: Bank X creates $500 of credit money and advances it to person A who uses the credit money to purchase goods worth $500 from person B**
    - **There are two phases to consider here:**
    - **1. The advancing of $500 of credit money by bank X to person A**
    - **The subsequent changes in the assets and liabilities of bank X and person A are the same as Case 3 (phase 1) except $500 of credit money has been advanced, not $1,000**
    - **2. The use of the 500 of credit money by person A to purchase goods worth $500 from person B**
    - ***2a. Person B also has a bank account with Bank X***
    - **The subsequent changes in the assets and liabilities of bank X and persons A and B are the same as Case 4a**
    - ***2b. Person B has a bank account with Bank Y.*** **The following occurs:**
    - ***2b(a). Should bank X already have at least $500 of base money residing in its reserve account*** **(perhaps due to a past net fiscal injection by the CICG), then bank X will simply transfer $500 of base money to bank Y**
    - **The subsequent changes in the assets and liabilities of the central bank, banks X and Y, and persons A and B are the same as in Case 4b**

# Appendix 5 – Reserve accounting

- **Reserve accounts of banks**
  - **Case 5: Bank X creates $500 of credit money and advances it to person A who uses the credit money to purchase goods worth $500 from person B**
    - **2. The use of the 500 of credit money by person A to purchase goods worth $500 from person B**
    - ***2b. Person B has a bank account with Bank Y.*** **The following occurs:**
    - ***2b(b). Should $500 of base money not reside in bank X's reserve account,*** **then bank X must obtain $500 of base money to enable person A to pay person B. The two ways bank X can obtain $500 of base money are the same as Case 3 (phases *2b*, a) and *2b*, b))**
    - **Payment for the goods – The subsequent changes in the assets and liabilities of the central bank, banks X and Y, and persons A and B are the same as in Case 4b**

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# Appendix 6 – 'Soft' & 'hard' savings; net financial assets

- **The domestic currency-users' balance = S – I**
  - **Change in the net financial assets of the domestic currency-using sector (ΔNFA) = change in financial assets (ΔFA) – financial liabilities (ΔFL) = S – I**
  - **S = currency users' savings**
  - ***All* of S is financed by financial injections yet to be destroyed, which include:**
    - **outstanding principal on advances of credit money (I)**
    - **untaxed income from CICG spending (G)**
    - **foreign spending on domestically-produced goods – untaxed income from export sales (X)**
  - **Assume:**
    - ***all* spending by currency-users financed by the creation and advancement of credit money consists of spending on capital goods (I)**
    - ***all* private-sector consumption expenditure is financed by current after-tax income (i.e., $C = f(Y_d)$), where $Y_d$ = disposable (after-tax) income**
  - **If S > I, ΔNFA = S – I > $0**
    - **Soft (temporary) savings = I = soft savings created by spending of credit money**
    - **Hard (permanent) savings = S – I = hard savings created by CICG spending of base money and/or income from net-exports**
  - **If S = I, ΔNFA = S – I = $0**
    - **Hard savings = $0; all savings are 'soft' savings**
  - **If S < I, ΔNFA = S – I < $0**
    - **Hard savings = $0; all savings are 'soft' savings; soft savings < credit money borrowed during the period/year that is spent on new goods and services**

# Appendix 6 – ‘Soft’ & ‘hard’ savings; net financial assets

- **Numerical example – basic equations (see Appendix 1):**
  - **Y = GDP (two ways to calculate GDP)**
    - **1) $Y = C + I + G + X - M$**
    - **2) $Y = \bar{A}$ x expenditure multiplier**
  - **$T = t.Y$**
    - **$t = 0.2$**
    - **$T = 0.2Y$**
  - **$Y_d = Y - T$**
    - **$Y_d = Y - 0.2Y = (1 - 0.2)Y = 0.8Y$**
  - **$C = c.Y_d$**
    - **$c = 0.75$**
    - **$C = 0.75(0.8Y) = 0.6Y$**
  - **$S = (1 - c)Y_d$**
    - **$1 - c = 0.25$**
    - **$S = 0.25(0.8Y) = 0.2Y$**
  - **$M = m.C$**
    - **$m = 0.167$**
    - **$M = 0.167(0.6Y) = 0.1Y$**

# Appendix 6 – 'Soft' & 'hard' savings; net financial assets

- **Assume:**
  - **I = $2,000**
  - **G = $2,000**
  - **X = $1,000**
  - **$\bar{A}$ = I + G + X = $2,000 + $2,000 + $1,000 = $5,000**
  - **Exp mult = 1/[1 – (*c* x (1 – *t*)(1 – *m*))] = 1/[1 – (0.8 x (1 – 0.25)(1 – 0.167))] = 2**
  - **Y = $\bar{A}$ x exp mult = $5,000 x 2 = $10,000**
  - **C = 0.6Y = 0.6($10,000) = $6,000**
  - **T = 0.2Y = 0.2($10,000) = $2,000**
  - **M = 0.1Y = 0.1($10,000) = $1,000**
  - **Y = C + I + G + X – M = $6,000 + $2,000 + $2,000 + $1,000 – $1,000 = $10,000**
  - **S = 0.2($10,000) = $2,000**
- **Sectoral balances:**
  - **G – T = $2,000 – $2,000 = $0**
  - **S – I = $2,000 – $2,000 = $0**
  - **X – M = $1,000 – $1,000 = $0**
  - **(G – T) = (S – I) – (X – M) (i.e., $0 = $0 – $0)**
  - **ΔNFA = S – I = $0**
  - **'Soft' savings = I = $2,000**
  - **'Hard' savings = S – I = $0**

# Appendix 6 – 'Soft' & 'hard' savings; net financial assets

- Assume:
  - Two-person nation consisting of person A and person B
  - After-tax income, C, and S are equally shared by persons A and B
  - I = $2,000 is undertaken by person B
- Person A:
  - $C_A = C/2 = \$6,000/2 = \$3,000$
  - $S_A = S/2 = \$2,000/2 = \$1,000$ (soft savings)
  - $I_A = \$0$
  - $\Delta NFA_A = S_A - I_A = \$1,000 - \$0 = \$1,000$
- Person B:
  - $C_B = C/2 = \$6,000/2 = \$3,000$
  - $S_B = S/2 = \$2,000/2 = \$1,000$ (soft savings)
  - $I_B = \$2,000$
  - $\Delta NFA_B = S_B - I_B = \$1,000 - \$2,000 = -\$1,000$
  - Person B uses the $1,000 of soft savings ($S_B$) to pay off $1,000 of debt ($1,000 remains outstanding)
- Total economy (end of first year):
  - $\Delta NFA = \Delta NFA_A + \Delta NFA_B = \$1,000 + (-\$1,000) = \$0$
  - Person A: has $1,000 of soft savings; Person B: owes $1,000

# Appendix 6 – 'Soft' & 'hard' savings; net financial assets

- In the *second year*, everything is the same except person B doesn't borrow credit money (i.e., $I_B$ = \$0; therefore I = \$0)
  - $\bar{A}$ = I + G + X = \$0 + \$2,000 + \$1,000 = \$3,000
  - Exp multiplier = 2
  - Y = $\bar{A}$ x exp multiplier = \$3,000 x 2 = \$6,000
  - C = 0.6Y = 0.6(\$6,000) = \$3,600
  - T = 0.2Y = 0.2(\$6,000) = \$1,200
  - M = 0.1Y = 0.1(\$6,000) = \$600
  - Y = C + I + G + X – M = \$3,600 + \$0 + \$2,000 + \$1,000 – \$600 = \$6,000
  - S = 0.2(\$6,000) = \$1,200
- Sectoral balances:
  - G – T = \$2,000 – \$1,200 = \$800 (net fiscal injection or 'budget deficit')
  - S – I = \$1,200 – \$0 = \$1,200
  - X – M = \$1,000 – \$600 = \$400
  - (G – T) = (S – I) – (X – M) (i.e., \$800 = \$1,200 – \$400)
  - ΔNFA = S – I = \$1,200
  - Soft savings = I = \$0
  - Hard savings = S – I = \$1,200
  - Note: The CICG's budget has gone into 'deficit' (net fiscal injection) even though G has not changed; T has fallen by \$800 (see Appendix 3)

# Appendix 6 – 'Soft' & 'hard' savings; net financial assets

- In the *second year*, everything is the same except person B doesn't borrow credit money (i.e., $I_B$ = \$0; therefore I = \$0)
- Person A:
  - $C_A = C/2 = \$3{,}600/2 = \$1{,}800$
  - $S_A = S/2 = \$1{,}200/2 = \$600$ (hard savings)
  - $I_A = \$0$
  - $\Delta NFA_A = S_A - I_A = \$600 - \$0 = \$600$
- Person B:
  - $C_B = C/2 = \$3{,}600/2 = \$1{,}800$
  - $S_B = S/2 = \$1{,}200/2 = \$600$ (hard savings)
  - $I_B = \$0$
  - $\Delta NFA_B = S_B - I_B = \$600 - \$0 = \$600$
  - Person B uses the \$600 of hard savings to pay off \$600 of debt (\$400 remains outstanding) – Note: this coverts \$600 of person A's soft savings from the first year into hard savings
- Total economy (end of second year):
  - $\Delta NFA$ (in second year) = $\Delta NFA_A + \Delta NFA_B = \$600 + \$600 = \$1{,}200$
  - NFA (end of second year) = $NFA_A + NFA_B = \$1{,}600 + (-\$400) = \$1{,}200$
  - Person A: has \$1,200 hard savings + \$400 soft savings; Person B: owes \$400

# Appendix 6 – 'Soft' & 'hard' savings; net financial assets

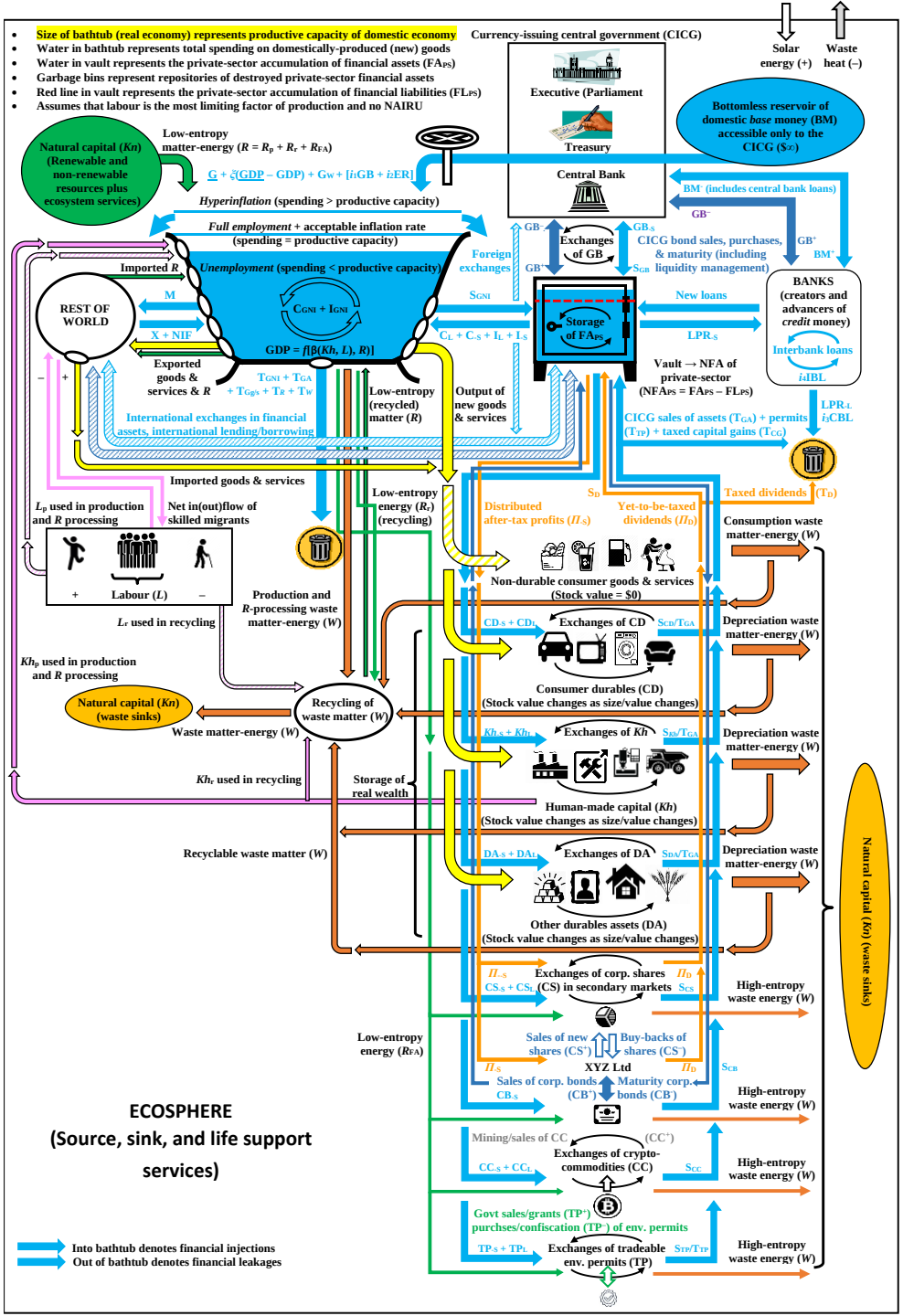
- In the *third year*, everything is the same as the second year (i.e., person B doesn't borrow credit money; $I_B$ = \$0; therefore I = \$0)
- Person A:
  - $C_A = C/2$ = \$3,600/2 = \$1,800
  - $S_A = S/2$ = \$1,200/2 = \$600 (hard savings)
  - $I_A$ = \$0
  - $\Delta NFA_A = S_A - I_A$ = \$600 – \$0 = \$600
- Person B:
  - $C_B = C/2$ = \$3,600/2 = \$1,800
  - $S_B = S/2$ = \$1,200/2 = \$600 (hard savings)
  - $I_B$ = \$0
  - $\Delta NFA_B = S_B - I_B$ = \$600 – \$0 = \$600
  - Person B uses \$400 of the \$600 of hard savings to pay off the remaining \$400 of debt (\$0 remains outstanding) – Note: this coverts person A's \$400 of soft savings into hard savings (thus, all of person A's \$1,000 of soft savings from the first year have been converted into hard savings)
- Total economy (end of third year):
  - (G – T) = (S – I) – (X – M) (i.e., \$0 = \$0 – \$0)
  - $\Delta NFA$ (in third year) = $\Delta NFA_A + \Delta NFA_B$ = \$600 + \$600 = \$1,200
  - NFA (end of third year) = $NFA_A + NFA_B$ = \$2,200 + \$200 = \$2,400
  - Person A: has \$2,200 of hard savings; Person B: has \$200 of hard savings

# Appendix 6 – 'Soft' & 'hard' savings; net financial assets

- Let's assume that, in the *second year*, person B doesn't borrow credit money and the CICG increases spending by $2,000 to fill the spending gap left because I = $0 (i.e., G = $4,000)
  - $\bar{A} = I + G + X = \$0 + \$4,000 + \$1,000 = \$5,000$
  - Exp multiplier = 2
  - $Y = \bar{A}$ x exp multiplier = $5,000 x 2 = $10,000
  - $C = 0.6Y = 0.6(\$10,000) = \$6,000$
  - $T = 0.2Y = 0.2(\$10,000) = \$2,000$
  - $M = 0.1Y = 0.1(\$10,000) = \$1,000$
  - $Y = C + I + G + X - M = \$6,000 + \$0 + \$4,000 + \$1,000 - \$1,000 = \$10,000$
  - $S = 0.2(\$10,000) = \$2,000$
- Sectoral balances:
  - $G - T = \$4,000 - \$2,000 = \$2,000$ (net fiscal injection or 'budget deficit')
  - $S - I = \$2,000 - \$0 = \$2,000$
  - $X - M = \$1,000 - \$1,000 = \$0$
  - $\Delta NFA = S - I = \$2,000$
  - Soft savings = I = $0
  - Hard savings = S – I = $2,000
  - Note: The CICG's budget has gone into 'deficit' (net fiscal injection) even though T has not changed; G has increased by $2,000

# Appendix 6 – 'Soft' & 'hard' savings; net financial assets

- **Let's assume that, in the *second year*, person B doesn't borrow credit money and the CICG increases spending by $2,000 to fill the spending gap left because I = $0 (i.e., G = $4,000)**
- **Person A:**
  - **$C_A = C/2 = \$6,000/2 = \$3,000$**
  - **$S_A = S/2 = \$2,000/2 = \$1,000$ (hard savings)**
  - **$I_A = \$0$**
  - **$\Delta NFA_A = S_A - I_A = \$1,000 - \$0 = \$1,000$**
- **Person B:**
  - **$C_B = C/2 = \$6,000/2 = \$3,000$**
  - **$S_B = S/2 = \$2,000/2 = \$1,000$ (hard savings)**
  - **$I_B = \$2,000$**
  - **$\Delta NFA_B = S_B - I_B = \$1,000 - \$0 = \$1,000$**
  - **Person B uses the $1,000 of hard savings to pay off the remaining $1,000 of debt ($0 remains outstanding) – Note: this coverts all of person A's $1,000 of soft savings from the first year into hard savings**
- **Total economy (end of second year):**
  - **$(G - T) = (S - I) - (X - M)$ (i.e., $\$2,000 = \$2,000 - \$0$)**
  - **$\Delta NFA$ (in second year) $= \Delta NFA_A + \Delta NFA_B = \$1,000 + \$1,000 = \$2,000$**
  - **$NFA$ (end of second year) $= NFA_A + NFA_B = \$2,000 + \$0 = \$2,000$**
  - **Person A: has $2,000 of hard savings; Person B: has $0 of savings and $0 debt**


Size of bathtub (real economy) represents productive capacity of domestic economy
Water in bathtub represents total spending on domestically-produced (new) goods
Water in vault represents the private-sector accumulation of financial assets (FAPS)
Garbage bins represent repositories of destroyed private-sector financial assets
Red line in vault represents the private-sector accumulation of financial liabilities (FLPS)
Assumes that labour is the most limiting factor of production and no NAIRU
Currency-issuing central government (CICG)
Executive (Parliament
Treasury
Central Bank
Solar energy (+)
Waste heat (–)
Bottomless reservoir of domestic base money (BM) accessible only to the CICG ($CC)
Natural capital (Kn) (Renewable and non-renewable resources plus ecosystem services)
Low-entropy matter-energy (R = Rp + Rr + RFA)
G + ξ(GDP – GDP) + GW + [i1GB + i2ER]
Hyperinflation (spending > productive capacity)
Full employment + acceptable inflation rate (spending = productive capacity)
Unemployment (spending < productive capacity)
CGNI + IGNI
GDP = f[β(Kh, L), R)]
REST OF WORLD
M
X + NIF
Imported R
Exported goods & services & R
TGNI + TGA + TGS + TR + TW
Foreign exchanges
GB-
GB+
Exchanges of GB
GB-S
SGB
CICG bond sales, purchases, & maturity (including liquidity management)
BM- (includes central bank loans)
GB-
GB+
BM+
SGNI
CL + CS + IL + IS
Storage of FAPS
New loans
LPRS
BANKS (creators and advancers of credit money)
Interbank loans
i4IBL
Vault → NFA of private-sector (NFAPS = FAPS – FLPS)
LPRL
i3CBL
CICG sales of assets (TGA) + permits (TTP) + taxed capital gains (TCG)
Output of new goods & services
Low-entropy (recycled) matter (R)
International exchanges in financial assets, international lending/borrowing
Imported goods & services
Lp used in production and R processing
Net in(out)flow of skilled migrants
Labour (L)
Low-entropy energy (Rr) (recycling)
SD
Taxed dividends (TD)
Distributed after-tax profits (ΠS)
Yet-to-be-taxed dividends (ΠD)
Consumption waste matter-energy (W)
Non-durable consumer goods & services (Stock value = $0)
Lr used in recycling
Production and R-processing waste matter-energy (W)
CDS + CDL
Exchanges of CD
SCD/TGA
Depreciation waste matter-energy (W)
Consumer durables (CD) (Stock value changes as size/value changes)
Khp used in production and R processing
Natural capital (Kn) (waste sinks)
Recycling of waste matter (W)
Waste matter-energy (W)
KhS + KhL
Exchanges of Kh
SKh/TGA
Depreciation waste matter-energy (W)
Khr used in recycling
Storage of real wealth
Human-made capital (Kh) (Stock value changes as size/value changes)
Recyclable waste matter (W)
DAS + DAL
Exchanges of DA
SDA/TGA
Depreciation waste matter-energy (W)
Other durables assets (DA) (Stock value changes as size/value changes)
ΠS
CSS + CSL
Exchanges of corp. shares (CS) in secondary markets
ΠD
SCS
High-entropy waste energy (W)
Low-entropy energy (RFA)
Sales of new shares (CS+)
Buy-backs of shares (CS-)
ΠS
XYZ Ltd
ΠD
SCB
Sales of corp. bonds (CB+)
Maturity corp. bonds (CB-)
CBS
High-entropy waste energy (W)
Mining/sales of CC
(CC+)
CCS + CCL
Exchanges of crypto-commodities (CC)
SCC
High-entropy waste energy (W)
Govt sales/grants (TP+) purchses/confiscation (TP-) of env. permits
TPS + TPL
Exchanges of tradeable env. permits (TP)
STP/TTP
High-entropy waste energy (W)
Natural capital (Kn) (waste sinks)
ECOSPHERE
(Source, sink, and life support services)
Into bathtub denotes financial injections
Out of bathtub denotes financial leakages

# Bathtub diagram with a NAIRU (non-accelerating inflation rate of unemployment)

**When there is a NAIRU (lopsided bathtub), there are labour demand and labour supply mismatches – these mismatches are inevitable and it is incumbent upon governments, together with the private sector, to limit the size of the NAIRU (i.e., limit the lopsidedness of the bathtub) (the NAIRU in the 1950s and 1960s in Australia was not much above the 'frictional' unemployment rate)**

**Note: The water level (spending) can spill over the lip of the bathtub (inflation) despite there being spare productive capacity; LFP = limiting factor of production**

- **Size of bathtub represents the productive capacity of the domestic economy**
- **Water in bathtub represents total spending on domestically produced (new) goods**
- **Shaded area = NAIRU**
- **Labour is the LFP**
- **Excessive inflation before full employment of LFP is achieved**