How Money is Created in the Modern World & Where it's Going

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Time to Unlearn

- If you've studied economics, then ***everything you were taught about money is wrong***
- Just ask the Bank of England: "Money creation in the modern economy"
  - "***The reality of how money is created today differs from the description found in some economics textbooks***" (McLeay, Radia et al. 2014)
- And the Bundesbank: "The role of banks, non- banks and the central bank in the money creation process"
  - "It suffices to look at the creation of (book) money as a set of straightforward accounting entries to grasp that
    - money and credit are created as the result of complex interactions between banks, non- banks and the central bank. And
    - ***a bank's ability to grant loans and create money has nothing to do with whether it already has excess reserves or deposits at its disposal***" (Deutsche Bundesbank 2017)

Time to Unlearn

- Mainstream "Neoclassical" economics is ***wrong on literally everything about money***:

	Neoclassical Economics	Real World
Private sector		
Banks	Intermediaries only	Money creators
Reserves	Essential role in lending	Irrelevant to lending
Debt	Irrelevant to economics	Critical to economics
Money	No role in Economics	Economics is fundamentally monetary
Credit	No role in Macroeconomics	Most volatile part of aggregate demand
Government		
Government	Disturbs market system	Creates market system
Debt	Owed to private sector	Created for private sector
Deficit	Undesirable in long run	Essential in long run
Surplus	Prudent during booms	Encourages speculative booms

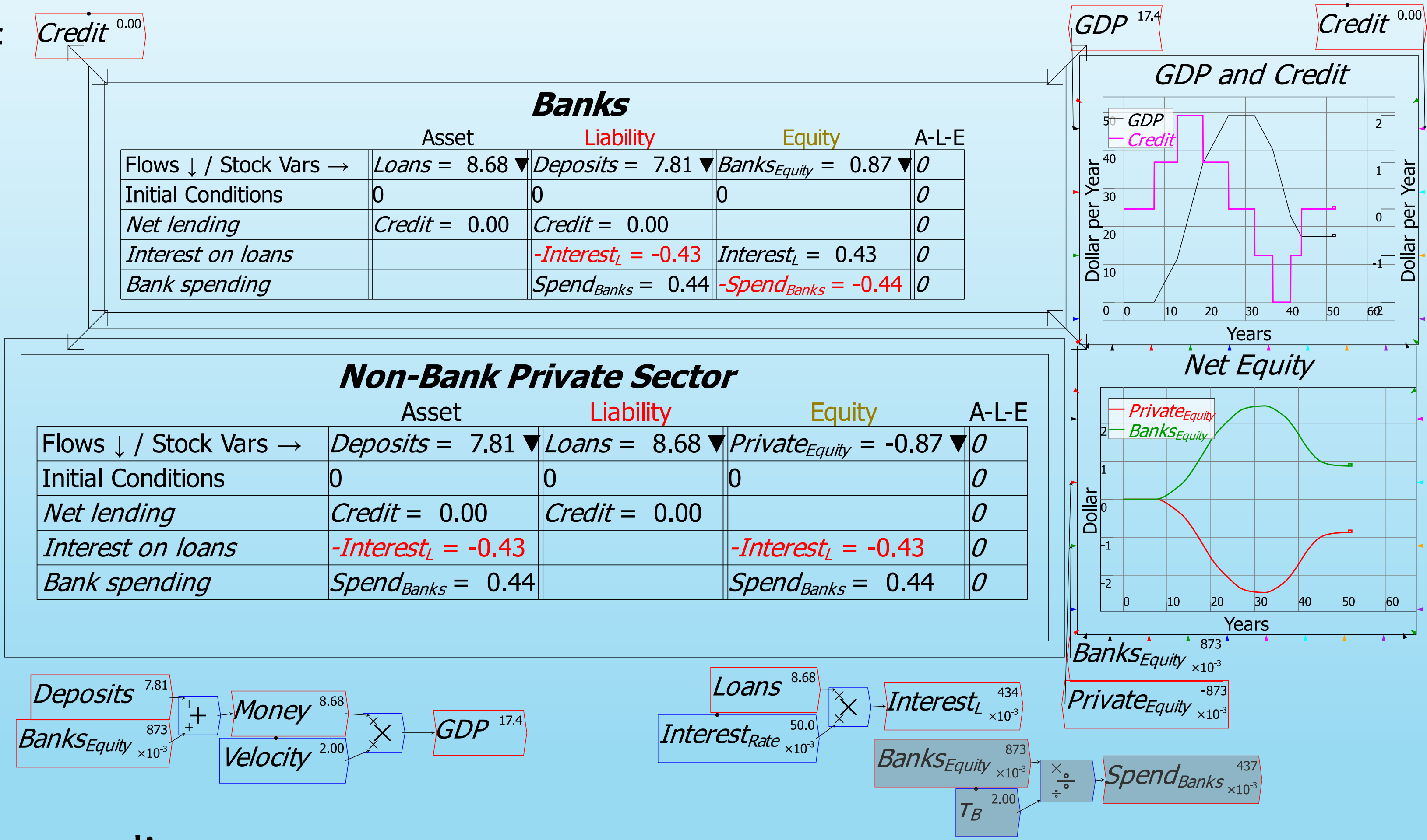
Time to Learn

- Nonfinancial assets differ
- Sum is massively positive
- Not covered in presentation
- Happy to discuss afterwards

- Money is created by accounting operations:
- “Fundamental Equation of Double Entry”: $\boldsymbol{Assets - Liabilities = Equity}$
- For ***financial*** assets (claims on other entities), ***the sum of all Assets & Liabilities is zero***
  - If one entity is in ***positive equity*** with respect to the rest of the economy
  - Then the rest of the economy is in ***identical negative equity*** with respect to it
- Banks **must not be** in negative equity. Therefore, in the absence of government
  - ***The non-bank private sector must be in negative equity***
- Governments, unlike private sectors, can cope with negative ***financial*** equity
  - Government “Deficit” (+ Interest on bonds/reserves) creates fiat money
  - ***Its negative equity enables (non-bank) private sector to be in positive equity***

How Money Is Created

- Both governments and banks create money "out of nothing": "endogenously"
- Banks: Increase Loans (Assets) & Deposits (Liabilities) simultaneously
- Government: Create negative financial equity for itself & positive for non-Government
- Free system dynamics program ***Minsky***—"the money telescope"—can explain both
- If you're serious about understanding money…
- Download ***Minsky*** from https://sourceforge.net/projects/minsky/



Banks

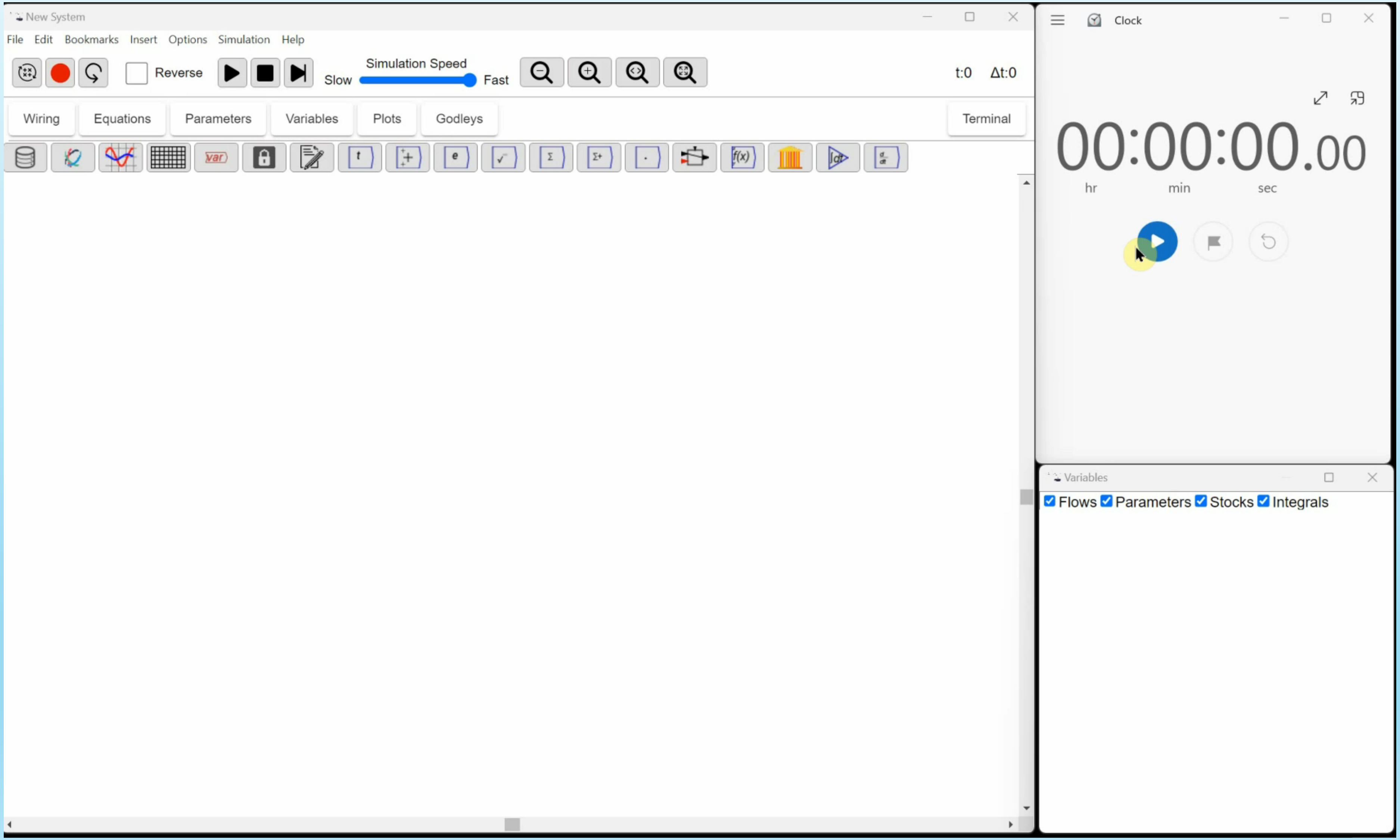
Flows ↓ / Stock Vars →	Asset *Loans* = 8.68 ▼	Liability *Deposits* = 7.81 ▼	Equity *$Banks_{Equity}$* = 0.87 ▼	A-L-E *0*
Initial Conditions	0	0	0	*0*
Net lending	*Credit* = 0.00	*Credit* = 0.00		*0*
Interest on loans		*$-Interest_L$* = -0.43	*$Interest_L$* = 0.43	*0*
Bank spending		*$Spend_{Banks}$* = 0.44	*$-Spend_{Banks}$* = -0.44	*0*

Non-Bank Private Sector

Flows ↓ / Stock Vars →	Asset *Deposits* = 7.81 ▼	Liability *Loans* = 8.68 ▼	Equity *$Private_{Equity}$* = -0.87 ▼	A-L-E *0*
Initial Conditions	0	0	0	*0*
Net lending	*Credit* = 0.00	*Credit* = 0.00		*0*
Interest on loans	*$-Interest_L$* = -0.43		*$-Interest_L$* = -0.43	*0*
Bank spending	*$Spend_{Banks}$* = 0.44		*$Spend_{Banks}$* = 0.44	*0*

How Money Is Created

- It's not hard to use…



- Less than 90 seconds to build the basics of credit money creation

How Money Is Created: Private Banks

- Add another "Godley Table" to show the non-bank private sector's point of view…
- General Rule:
- ***To create money, an operation must affect the Asset side of the Banking Sector's ledger, as well as the Liabilities/Equity Side***

Banks

	Asset	Liability	Equity	A-L-E
Flows ↓ / Stock Vars →	*Loans* ▼	*Deposits* ▼	*$Banks_{Equity}$* ▼	*0*
Initial Conditions	0	0	0	*0*

Creates Money

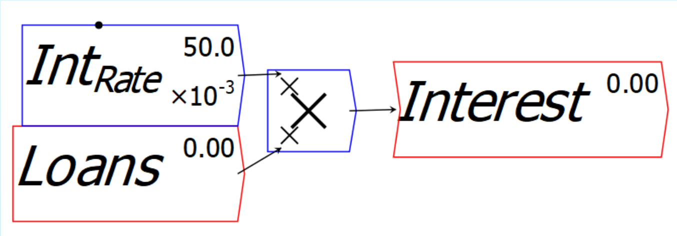
Does Not Create Money

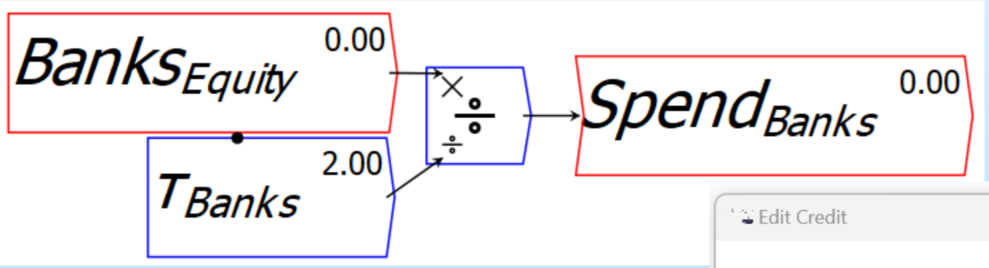
Private Sector

	Asset	Liability	Equity	A-L-E
Flows ↓ / Stock Vars →	*Deposits* ▼	*Loans* ▼	*$Private_{Equity}$* ▼	*0*
Initial Conditions	0	0	0	*0*
Net Lending	*Credit*	*Credit*		*0*
Interest payments	*-Interest*		*-Interest*	*0*
Bank Spending	*$Spend_{Banks}$*		*$Spend_{Banks}$*	*0*

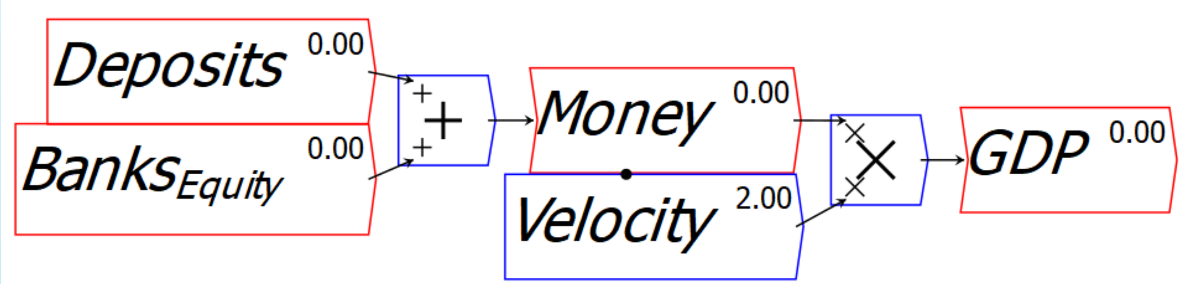
How Money Is Created: Private Banks

- Dynamics create positive equity for banks, identical negative equity for non-banks
- To model, define the flows ***Interest*** and ***Spend$_{Banks}$*** on the canvas

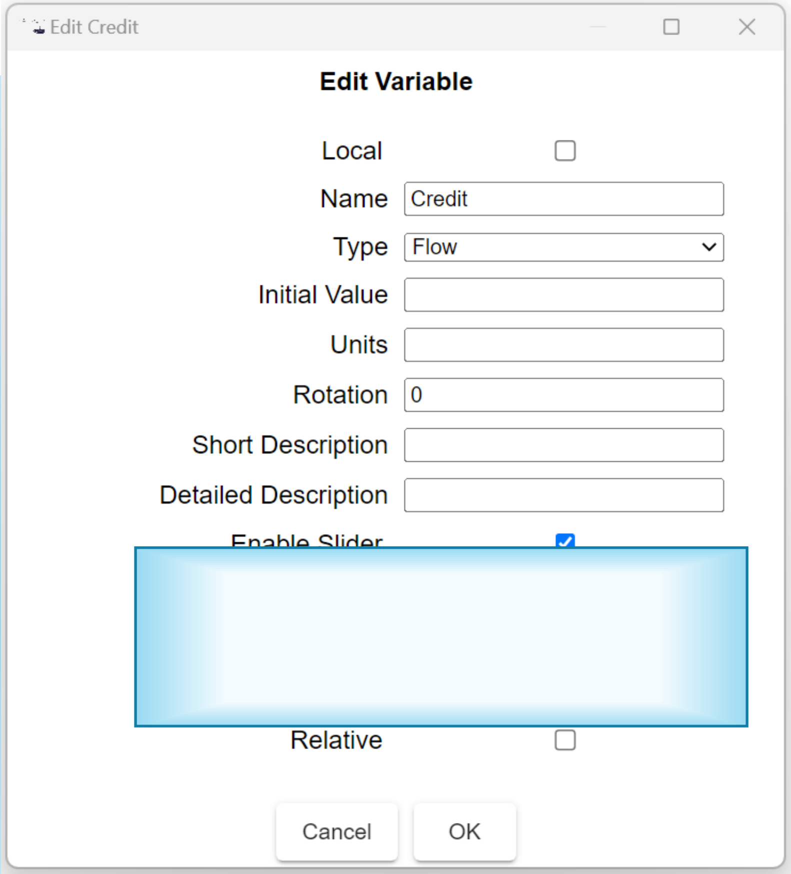




- **Money as the sum of Deposits & (short-term) Bank Equity**
- GDP as the turnover of Money

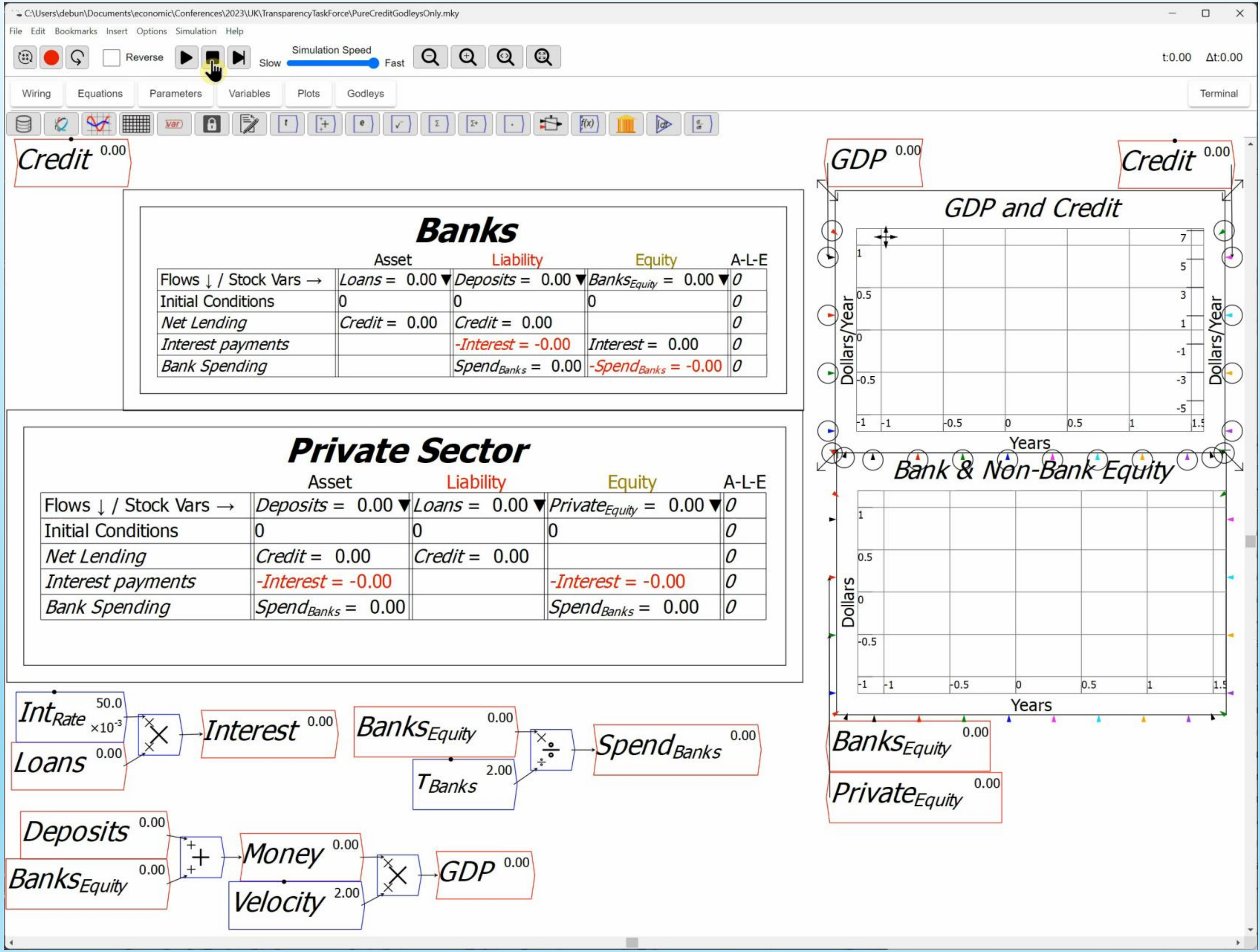


- Use Credit as a control variable with a range from +100 to -100
- Value can be varied using arrow keys during a simulation…



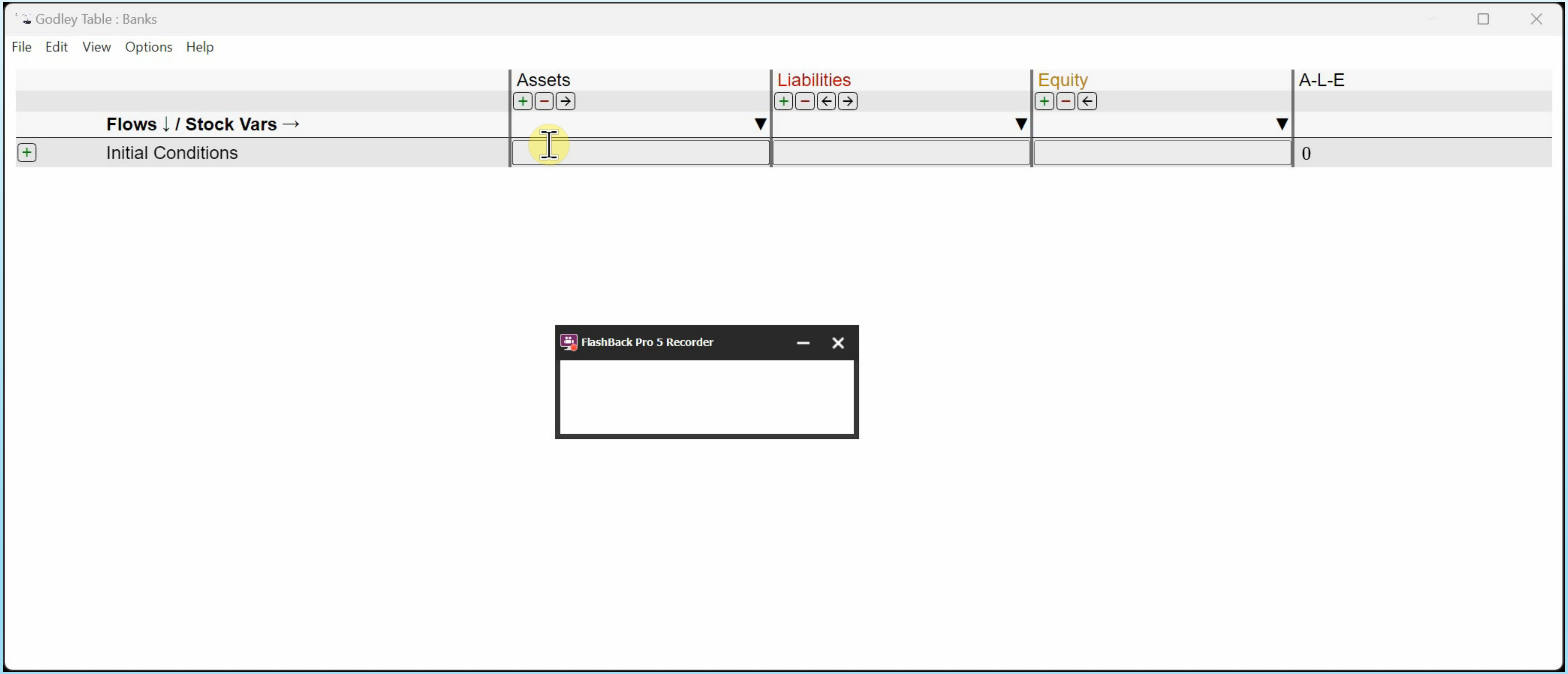
How Money Is Created: Private Banks

- Lending creates positive equity for banks, negative equity for non-banks
- This is just how private banking works
- Combined with macro rule that sum of all financial equity is zero, then…
- In the absence of fiat money, the non-bank private sector ***must*** be in negative financial equity.



How Money Is Created: Governments and Fiat Money

- Same basic story for Government money creation



How Money Is Created: Governments and Fiat Money

- Add Godley Table for Private Sector:
- Government spending in excess of taxation
  - Creates Fiat Money
  - Creates Reserves
  - Adds to the financial equity of the non-bank public
- Interest on Treasury bonds
  - Creates Fiat Money
  - Creates Reserves
  - Adds to the equity of the private banking system

Banks

	Asset		Liability	Equity	A-L-E
Flows ↓ / Stock Vars →	*Reserves*▼	*Bonds$_B$*▼	*Deposits*▼		*0*
Initial Conditions	0	0	0		*0*

Creates Money

Does Not Create Money

Private Sector

	Asset	Liability	Equity	A-L-E
Flows ↓ / Stock Vars →	*Deposits*▼	▼		*0*
Initial Conditions	0			*0*
Net government spending	*Fiat*			*0*
Bank Spending	*Spend*		*Spend*	*0*

How Money Is Created: Governments and Fiat Money

- Where goes the government "get" the money? Treasury Godley Table…
- It creates the money
- By going into negative financial equity for itself
- Negative equity of Treasury creates identical positive equity for non-government sectors
- ***Bond sales play no role in money creation***
- So what do they do?
- They ensure that the Treasury's account at the Central Bank doesn't go negative if $\boldsymbol{Bond\ Sales = Fiat + Interest}$

Treasury

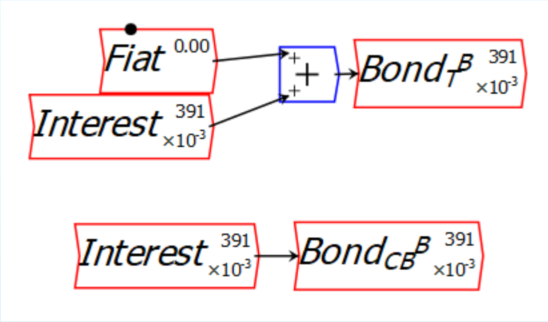
	Asset	Liability		Equity	A-L-E
Flows ↓ / Stock Vars →	$Treasury_{CRF}$	$Bonds_B$	$Bonds_{CB}$	$Treasury_{Equity}$	*0*
Initial Conditions	0	0	0	0	*0*
Treasury Bond Sales	$Bond_T^B$	$Bond_T^B$			*0*
Net government spending	$-Fiat$				*0*
Interest on existing bonds	$-Interest$				*0*
Central Bank Bond Buying		$-Bond_{CB}^B$	$Bond_{CB}^B$		*0*

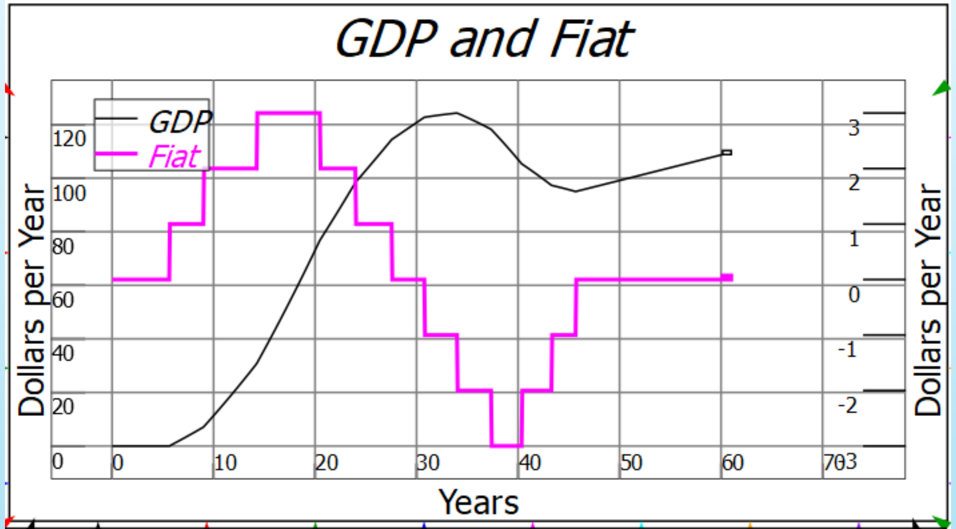
Central Bank

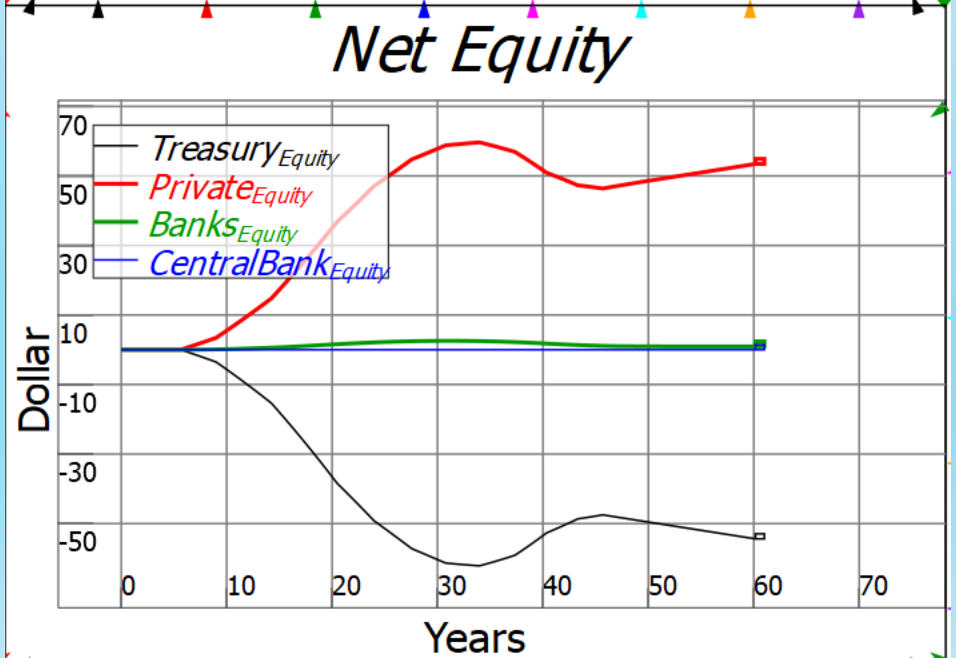
	Asset	Liability		Equity	A-L-E
Flows ↓ / Stock Vars →	$Bonds_{CB}$	$Reserves$	$Treasury_{CRF}$	$CentralBank_{Equity}$	*0*
Initial Conditions	0	0	0	0	*0*
Treasury Bond Sales		$-Bond_T^B$			*0*
Central Bank Bond Buying	$Bond_{CB}^B$	$Bond_{CB}^B$			*0*
Net government spending		$Fiat$			*0*
Interest on existing bonds		$Interest$			*0*

How Money Is Created: Governments and Fiat Money

- Same equations as for Pure Credit system, plus Bond sales:



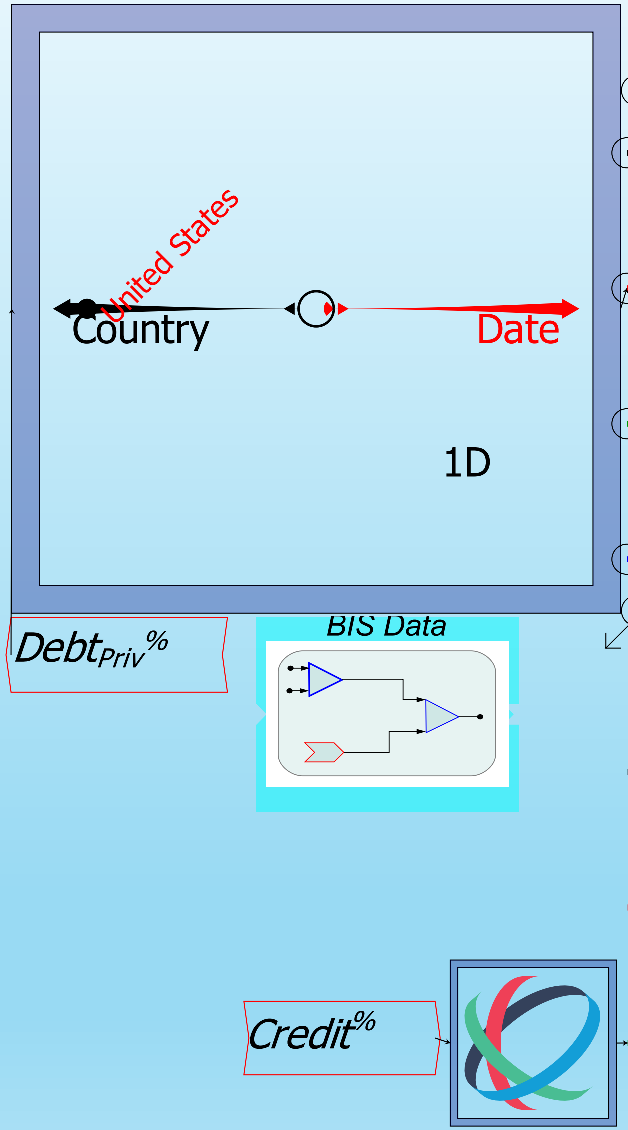


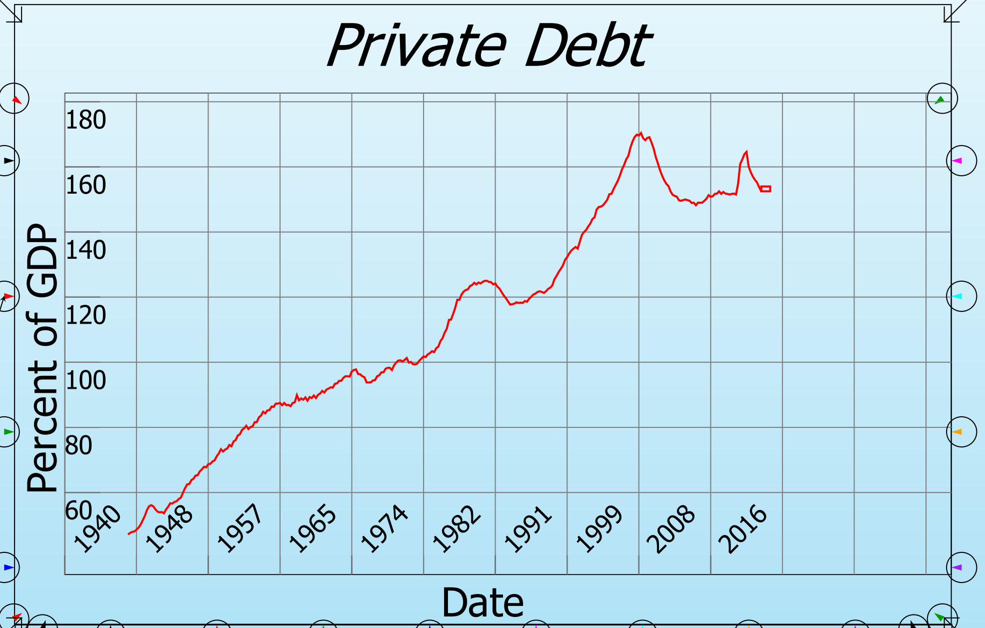


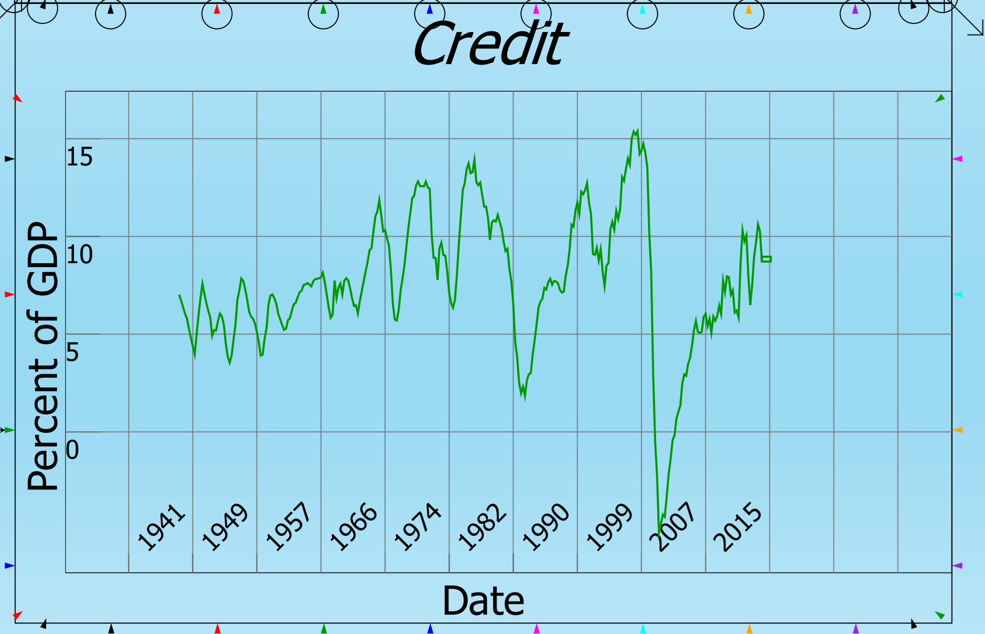
- Negative government equity from Fiat money creation enables non-bank private sector to be in positive equity:

How Money Is Created: Mixed Credit and Fiat Money

- Mainstream false focus on government debt & ignores role of private debt
- Bernanke: "Absent implausibly large differences in marginal spending propensities … pure redistributions should have no significant macroeconomic effects"
- The data begs to differ…







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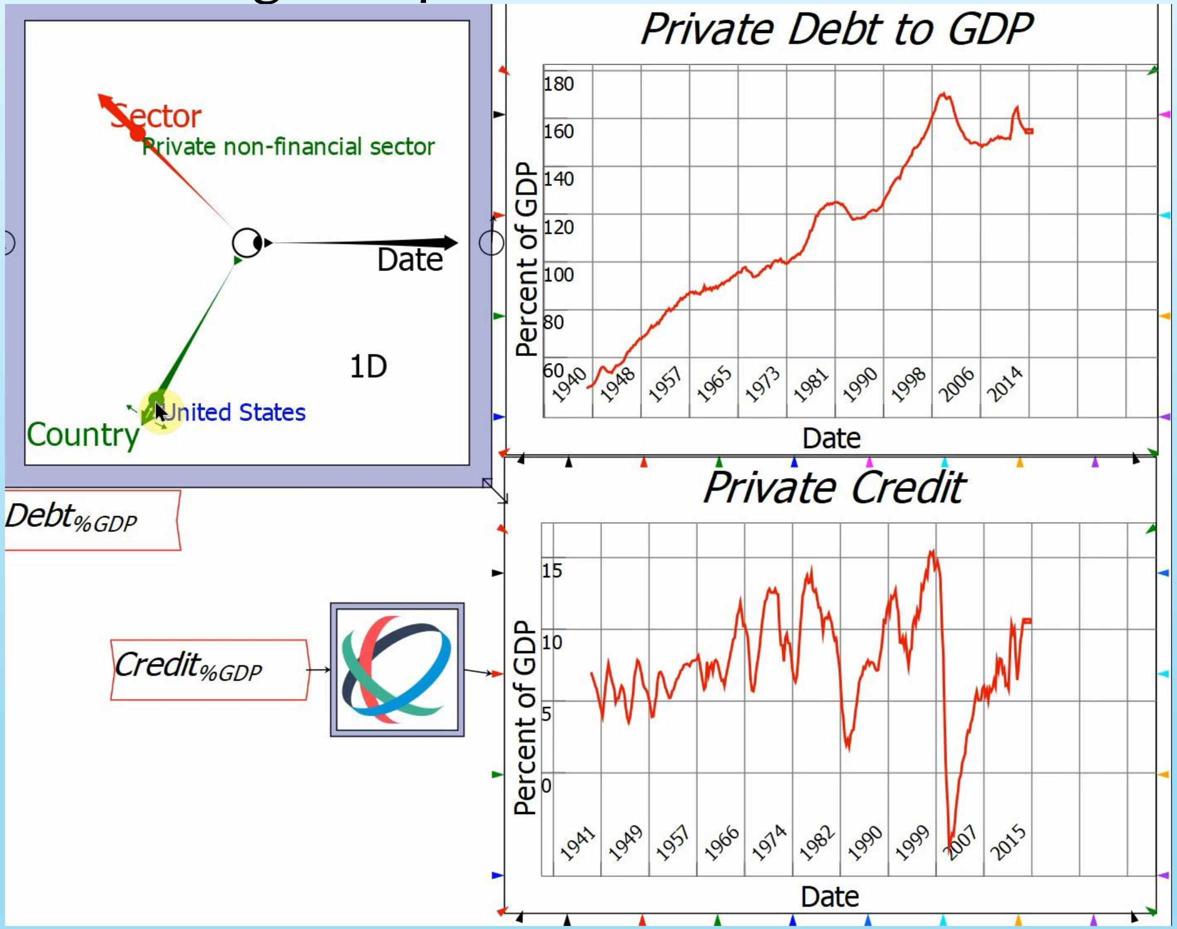
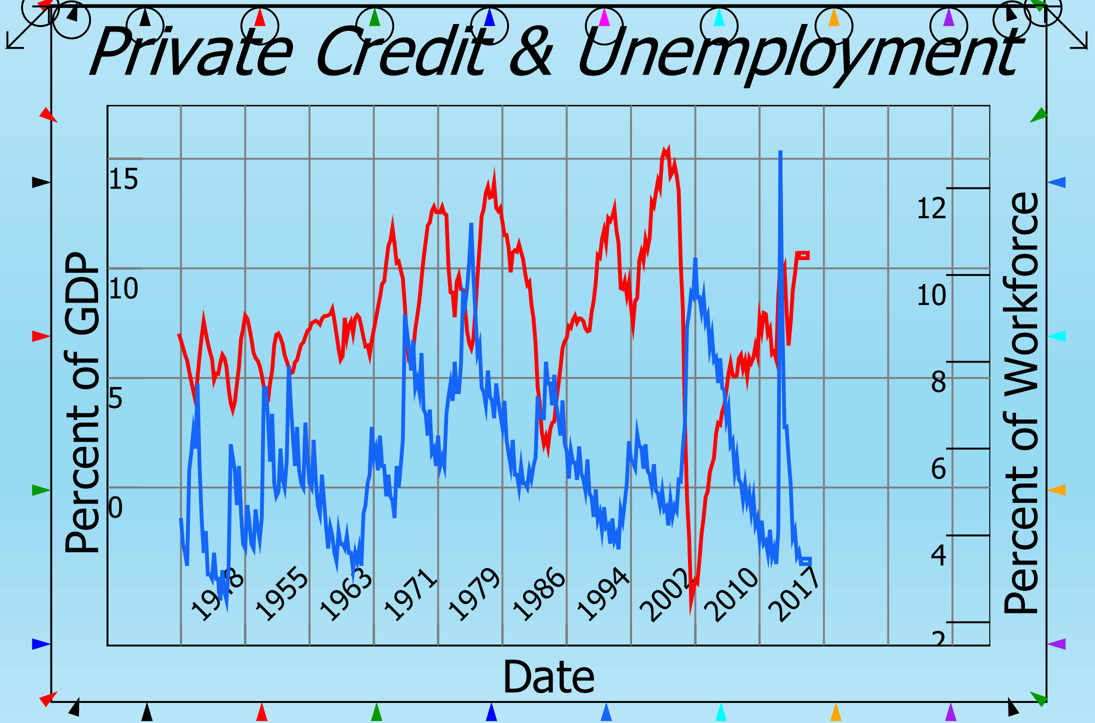
Credit Dominates

- Credit is the main cause of booms and busts
- This is a global phenomenon:

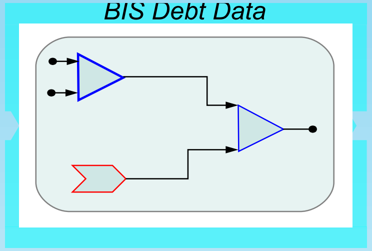


- The mainstream obsession with government debt has made it worse



How Money Is Created: Mixed Credit and Fiat Money

- Increase in global debt coincides with Neoliberal obsession with government debt:



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Where is money going?

- Economists have fooled themselves & us about climate change as well as money
  - See ***The appallingly bad neoclassical economics of climate change*** (Keen 2020)
  - Major report coming out for Carbon Tracker very soon too
- What economists claim about climate change (Howard and Sylvan 2021):
  - 7°C warming will reduce GDP two centuries hence by 20%

		GDP in 2019 US$		Annual Average Growth Rate from 2025		
Year	GW in °C	Without GW	With GW	Without GW	With GW	Fall in growth rate
2025	1.2	173.3	171.6			
2075	3	595.1	565.3	2.48%	2.46%	0.015%
2130	5	1430.4	1287.4	1.34%	1.33%	0.017%
2220	7	3654.5	2923.6	0.82%	0.80%	0.021%

- What do scientists expect from more than 5°C?: "unknown, implying ***beyond catastrophic, including existential threats***" (Xu and Ramanathan 2017)

Where is money going?

- Next major need for money will be “war economy” financing of decarbonisation
- Private financial system likely to collapse without state support
- We will need a means for rationing (at least) carbon consumption
- Proposal: “Tradeable Universal Carbon Credits”
  - All goods have 2 prices, money & carbon price
  - Carbon ration distributed (daily/weekly) via CDBC at national average
  - Bottom 95% would have excess carbon credits to sell to top 5%
  - See https://ecocore.org/

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