- One shortcoming of traditional economic models is the failure to integrate the flows of the real economy and the financial side.
    - Classical dichotomy is closely related to the QTM and was attacked by Keynes who posited that money special properties that distinguished it from simple being a commodity like bourbon

Balance sheet

- considers stocks of assets and liabilities and helps understand financial structure of economy.
- Disaggregating households and firms is an essential feature
- Disaggregate firms into production and financial

Quadruple entry principle and production with private money

- Transactions flow matrix guarantees coherence- see where everything comes from and goes to
- Now we will use it to see how production is financed
    - Tie together real decisions and monetary and financial consequences
- Set up the transactions matrix with 3 sectors: households, production firms, and banks
    - Firms should get two columns- current and capital
        - Current shows receipts and expenditures
        - Capital shows transactions that affect their balance sheet
    - Two stocks: loans and deposits
        - Recall, we integrated the transactions and balance sheet matrices with ΔH

First step

- Assume that firms borrow from banks, at beginning of production period, the amount needed to pay wages
    - Think, pair, share- how does the borrowing show up in the transaction matrix?
    - Results in 4 entries bc financial flows involve 2 transactors
    - Given the consistency (summing to 0), any alteration to a cell, involves modification to 3 other cells
- - use of funds. + source of funds. Change in deposits gets a + and loans a -. This does not imply that banks are lending deposits. Money deposits is the source of funds allowing the use of bank loans. The cause of the increase in loans and deposits is the willingness to contract an additional liability and the desire to expand expenditures.

		Production firms		Banks	
	Households	Current	Capital	Capital	Σ
Consumption					
Investment					
Wages					
Δ loans			$+\Delta L_f$	$-\Delta L$	0
Δ deposits			$-\Delta M_f$	$+\Delta M$	0
Σ			0	0	0

Second step

- Firms transfer the deposits via check or electronic deposit to workers who produce goods for the firm.
    - Output has been produced but not sold. Unsold production increases inventories which we will treat as an investment in working capital that the firm purchases from itself at the cost of production (the wagebill).
    - Think pair share. How does the payment of wages affect the transaction matrix?

		Production firms		Banks	
	Households	Current	Capital	Capital	Σ
Consumption					
Investment		$+I$	$-I$		0
Wages	$+WB$	$-WB$			0
Δ loans			$+\Delta L_f$	$-\Delta L$	0
Δ deposits	$-\Delta M_h$			$+\Delta M$	0
Σ	0	0	0	0	0

Final step

- Households use money balances acquired through wages (or also dividends and interest) to consume. As households get rid of their money balance, firms recover theirs which allows them to repay the loans.
- If the firm uses income from sale of consumption goods and not to accumulate money balances itself, households holding of money balances out of wages has a loan as its exact counterpart.
    - Loan granting activity created a flow of money into the economy, purchase of consumption goods creates a reflux- the destruction of money.
    - This series of transactions can be understood as creation, circulation, and destruction of money.

Discussion

- Did the stock of money, as Friedman posited, fall from a helicopter with no counterpart in the rest of the economy?
- Do changes in the real economy and the resulting financial flows affect the stock of money? Is the stock of money fixed and exogenously determined?
    - No, that conception is meaningless.

Production with central bank money

- Append two more columns to our matrix, government and central bank and add a few different transaction rows
- Government orders goods from production firms. To purchase the goods, the government
    - could draw on its line of credit at the central bank- Government gets HPM via a loan from the central bank
    - could sell bonds to the central bank or commercial bank.

- Both of these options scare many mainstream economists, but lets assume that the CB buys bonds from govt.
- Think pair share. How does the sale of bonds (B) to the CB in exchange for HPM (H) show up in the matrix?

-

		Production firms	Banks		Central bank	
	Households	**Current**	**Capital**	**Government**	**Capital**	**Σ**
Govt. exp.						
Income [GDP]						
Change in cash				$-\Delta H_g$	$+\Delta H$	0
Change in deposits						0
Change in bills				$+\Delta B$	$-\Delta B_{cb}$	0
Σ				0	0	0

Second step

- Government purchases goods from firms, G. Firms receive checks, drawn on the govt's account at the CB. Firm deposits the checks into their account at the bank, creating deposits M and increasing the cash held by banks.
  - Think pair share. Represent these transactions on the matrix.

		Production firms	Banks		Central bank	
	Households	**Current**	**Capital**	**Government**	**Capital**	**Σ**
Govt. exp.		$+G$		$-G$		0
Income [GDP]						
Change in cash			$-\Delta H_b$		$+\Delta H$	0
Change in deposits		$-\Delta M_f$	$+\Delta M$			0
Change in bills				$+\Delta B$	$-\Delta B_{cb}$	0
Σ		0	0	0	0	0

Third step

- Firms use the deposits to pay workers and distribute profit to owners, Y. Assume that all profits are distributed to households. Household deposits check into their account at the bank.
  - Think pair share. Represent these transactions in the matrix.

		Production firms	Banks		Central bank	
	Households	Current	Capital	Government	Capital	Σ
Govt. exp.		$+G$		$-G$		0
Income [GDP]	$+Y$	$-Y$				0
Change in cash			$-\Delta H_b$		$+\Delta H$	0
Change in deposits	$-\Delta M_h$		$+\Delta M$			0
Change in bills				$+\Delta B$	$-\Delta B_{cb}$	0
Σ	0	0	0	0	0	0

Discussion

- In accordance with mainstream textbooks, government deficit created reserves held by banks. Does this increase in reserves lead to the creation of a multiple of money deposits as told in the money multiplier story?
    - No. having reserves does not lead to the sudden appearance of credit-worthy borrowers. Banks could hold the cash or buy bonds.
    - The central bank sets an interest rate to achieve a desired inflation level. To keep the interest rate at its target, it must buy and sell bonds to absorb or expand money balances in accordance to the desires of the private sector.

Overdraft economy

- This is the more realistic presentation of how financial systems work.
- Assume that firms don't hold financial assets, but depend on banks for liquidity
- Private banks, rather than hold government securities borrow from the central bank to obtain the reserves and cash they need
    - Banks are in debt to the CB
- Government expenditure (G) is financed by a loan from banks to the govt.

		Production firms	Banks		Central bank	
	Households	Current	Capital	Government	Capital	Σ
Govt. exp.						
Income [GDP]						
Change in cash						
Change in deposits			$+\Delta M$	$-\Delta M_g$		0
Change in bank loans			$-\Delta L$	$+\Delta L_g$		0
Change in central bank advances						
Σ			0	0		0

- The expenditure generates income, Y, which is paid to households which keep part of it as money balances, M, and part of it as cash, H.
- To meet the cash needs, banks borrow from the CB, A.

		Production firms	Banks		Central bank	
	Households	**Current**	**Capital**	**Government**	**Capital**	**Σ**
Govt. exp.		$+G$		$-G$		0
Income [GDP]	$+Y$	$-Y$				0
Change in cash	$-\Delta H_h$				$+\Delta H$	0
Change in deposits	$-\Delta M_h$		$+\Delta M$			0
Change in bank loans			$-\Delta L$	$+\Delta L_g$		0
Change in central bank advances			$+\Delta A$		$-\Delta A$	0
Σ	0	0	0	0	0	0

Discussion

- How does the central bank achieve its targeted interest rate in the overdraft system?
    - By setting the rate on A, advances to the banks.