

Monetary Statistics & Money Supply

ခြုံငုံသုံးသပ်ချက်

Jan Gottschalk
TAOLAM

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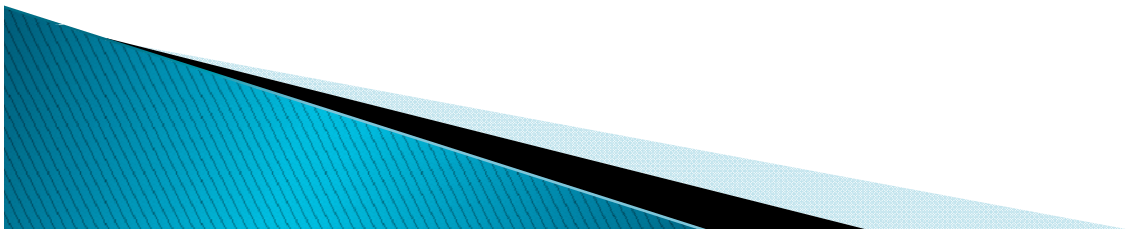


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“Introduction to Financial Programming”
December 16-20, 2013 Yangon, Myanmar



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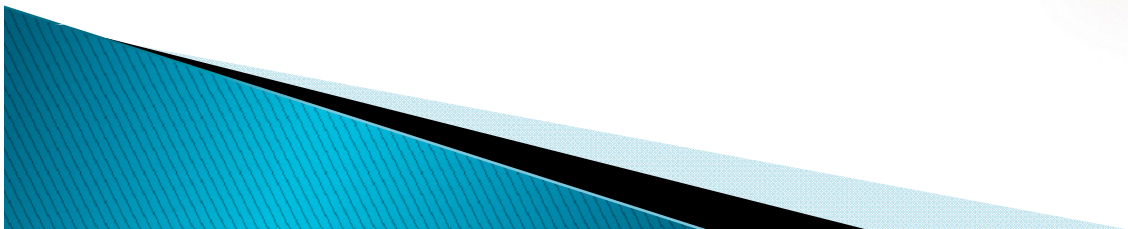
- I. Monetary Statistics
- II. Money Creation
- III. Summary





I. Monetary Statistics

- Scope of Financial Statistics
- Central Bank Accounts
- Commercial Bank Accounts
- Monetary Survey





I. Monetary Statistics

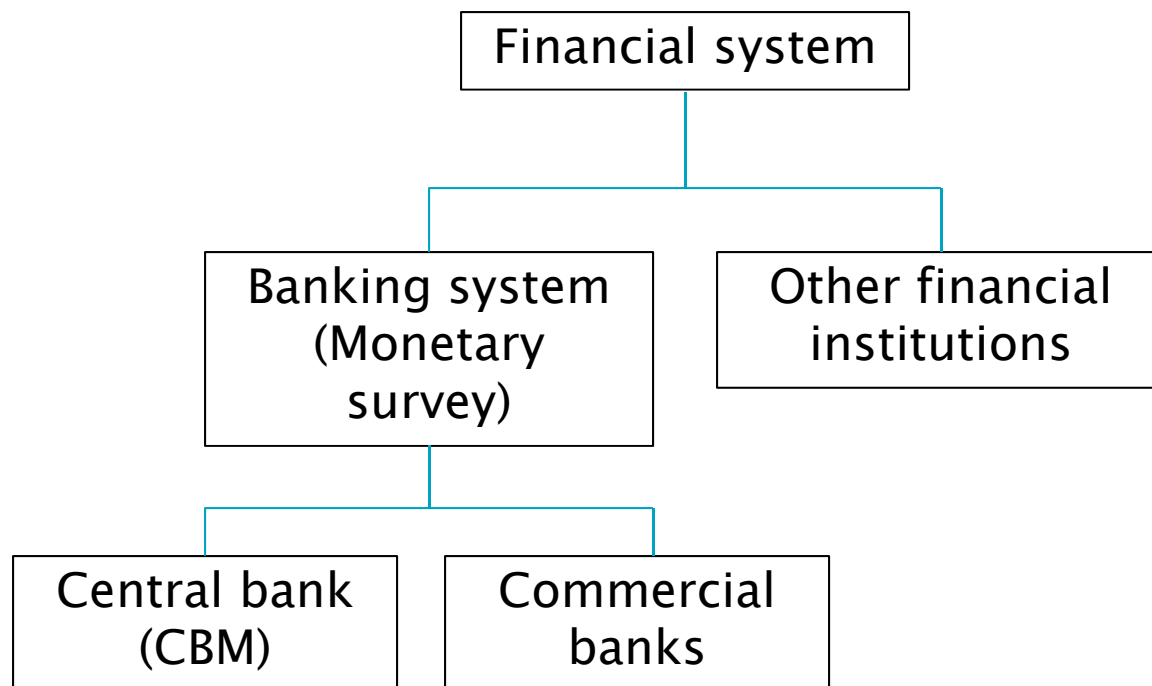


Monetary statistics accounts are critical for analysis of monetary conditions and formulation as well as implementation of monetary policy

Understanding links between monetary policy and inflation, real economic activity, external account and foreign exchange rate will require going beyond monetary accounts



I.A Scope of the Financial System





Myanmar Financial System

- ▶ Central bank = CBM
- ▶ Commercial banks =
 - ✓ State-owned commercial banks (MEB, MFTB, MICB, MADB)
 - ✓ Private commercial banks
- ▶ Other financial institutions =
 - ✓ Microfinance institutions
 - ✓ Financial leasing companies (Oriental Leasing Co. Ltd.)
 - ✓ Insurance companies (Myanmar Insurance)



I.B ဗဟိုဘဏ်စာရင်း

ဗဟိုဘဏ်၏ B/S ကို တိုက်ရိုက်အကျိုးသက်ရောက်မှုရှိသော လုပ်ဆောင်ချက်များ

- ✓ ငွေကြေးထုတ်ခြင်း
- ✓ ငွေကြေးစည်းမျဉ်းချမှတ်ခြင်း(ငွေကြေးမူဝါဒ)
- ✓ အစိုးရ၏ Banker အရလုပ်ဆောင်ရခြင်း
- ✓ တိုင်းပြည်၏နိုင်ငံခြားအရန်ငွေကို ကိုင်ထားရခြင်း
(ငွေလဲနှုန်းမူဝါဒ)



Analytical Balance Sheet of CB

$$\text{RM} = \text{NFA} + \text{NDA}$$

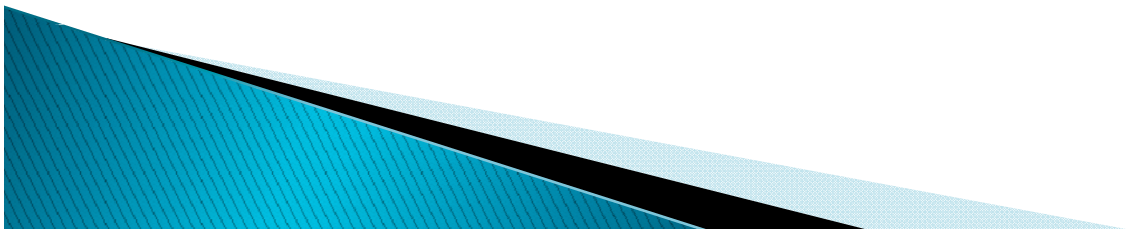
Net foreign assets (NFA)	Reserve money (RM)
Net domestic assets (NDA)	Currency issued
Net claims on the government (NCG)	Held in banks
Claims on commercial banks	Held outside banks
Claims on other resident sectors	Deposits (reserves) of commercial banks with central bank
Other items net	Other deposits



Analytical Balance Sheet of CB (continued)

Assets

- ▶ Net foreign assets
 - holding the country's foreign reserves (exchange rate policy)
- ▶ Net claims on government
 - acting as banker of the government
- ▶ Claims on commercial banks
 - regulating the money supply (monetary policy)

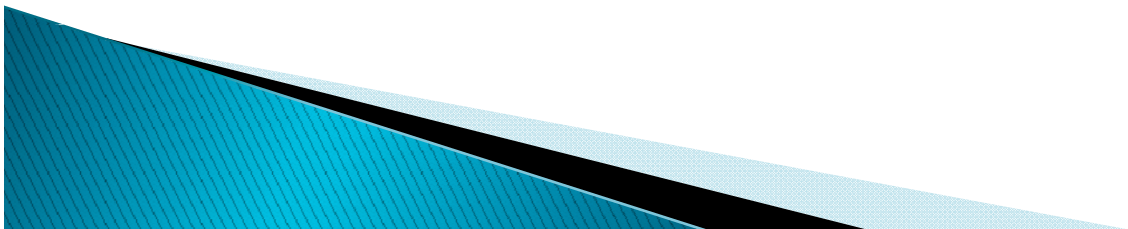




Analytical Balance Sheet of CB (continued)

Liabilities

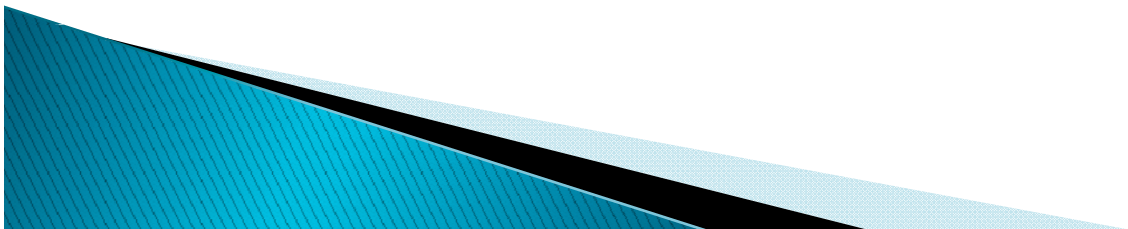
- ▶ Currency issued
 - Issuing of currency
 - Deposits of commercial banks with central bank → regulating the money supply (monetary policy)





အဘယ်ကြောင့် အရန်ငွေသည် အရေးပါသနည်း

- ဗဟိုဘဏ်သည် အရန်ငွေကို ထိန်းချုပ်ရသည်။ အကြောင်းမှာ သူ၏ B/S တွင် ဖန်တီးထားခြင်းဖြစ်သည်။
- As we will see below when we consider the endogenous money creation process, some components of reserve money have an important influence over the creation of bank credit to the rest of the economy
- Bank credit is important for aggregate demand conditions, and it is a key part of broad money
- Hence, in a monetary targeting regime control over reserve money gives the central bank an instrument to steer broad money into the desired direction (intermediate target) and influence demand, which matters for inflation (ultimate target)

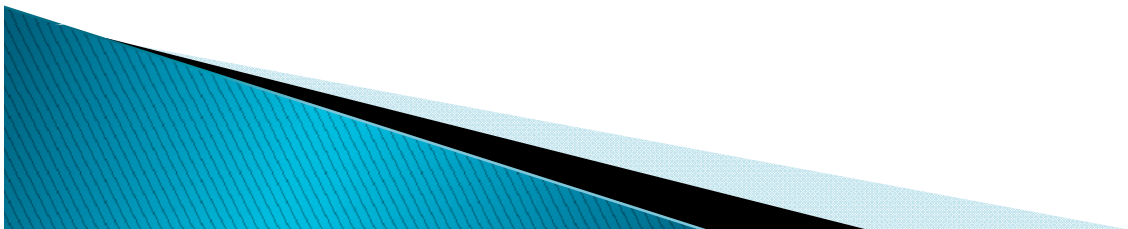




CBM B/S ၏ အဓိကအပိုင်းများ

Exercise 1:

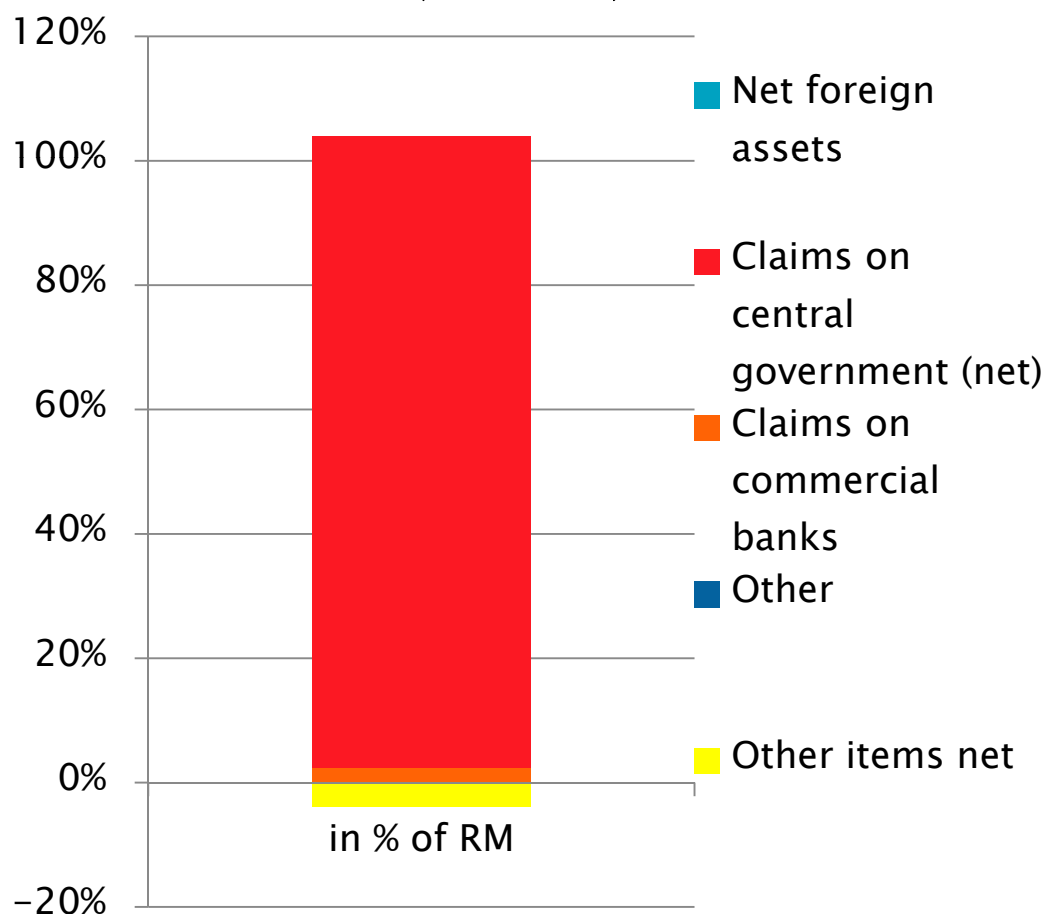
- ▶ Use monetary table in Article IV report to portray the CBM balance sheet for 2011 / 12 in the form depicted in the previous slide
- ▶ Analyze the relative importance of the individual asset and liability components by expressing them in percent of reserve money
- ▶ How does the composition of the CBM balance sheet compare with that of the Bank of Thailand?



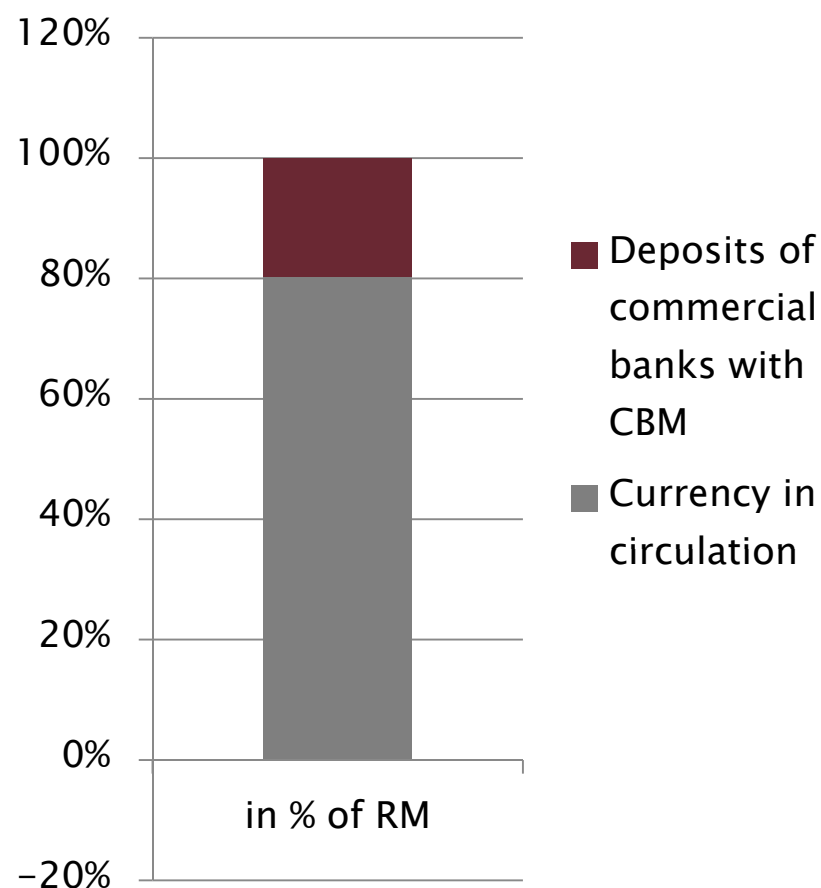


Main Components of CBM Balance Sheet (continued)

Composition of Reserve Money – CBM Assets
(in % of RM)



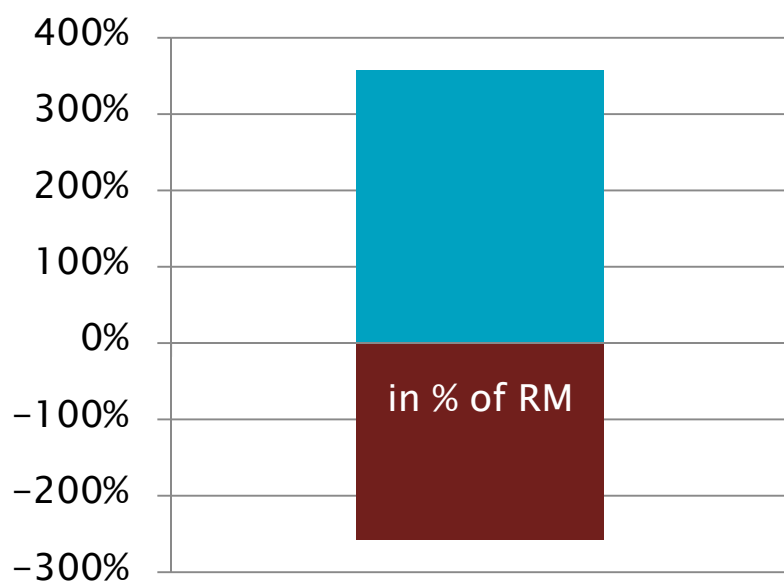
Composition of Reserve Money – CBM Liabilities (in % of RM)





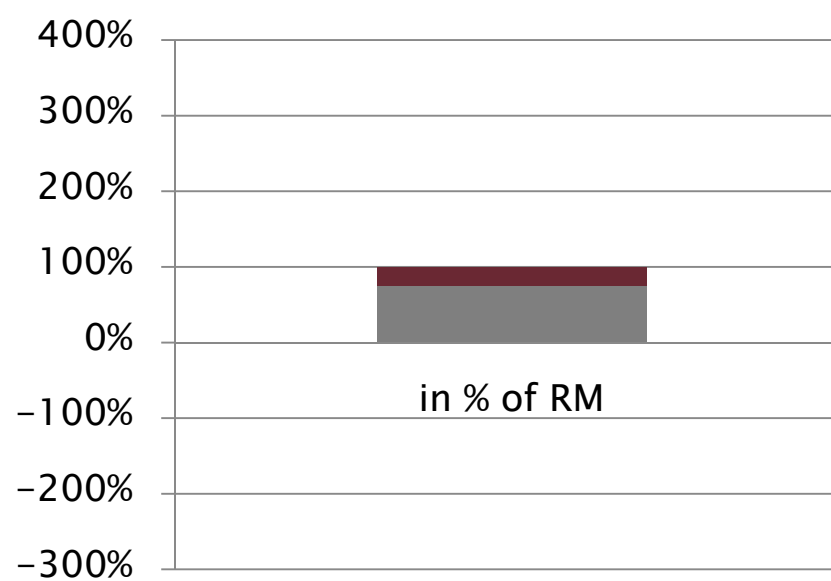
Main Components of CBM Balance Sheet—How Does This Compare with Composition of Bank of Thailand Balance Sheet?

Composition of Reserve Money –
BoT Assets (in % of RM)



■ Net foreign assets
■ Net domestic assets

Composition of Reserve Money
– BoT Liabilities (in % of RM)



■ Currency in circulation
■ Deposits of commercial banks with CBM



Central Bank Balance Sheet Examples

- ▶ Example: On the first day of its operations, central bank decides to issue the currency (Kyat 100) in exchange for foreign currency.

<u>Assets</u>		<u>Liabilities</u>	
CB's Net Foreign Assets	100	Base money	100
Foreign exchange	100		
CB's Net Domestic Assets			

- ▶ Example: Central bank sells gov't securities (worth Kyat 30).

<u>Assets</u>		<u>Liabilities</u>	
CB's NFA	100	Base money	70
Foreign exchange	100		
CB's NDA	-30		
Net domestic credit	-30		



Changes in the CBM Balance Sheet

Exercise 2:

- ▶ Use the 2011 /12 CBM balance sheet to look at the effect of a purchase of 800 million kyats in foreign currency in exchange for domestic currency
 - ▶ Next, look at the effect of a sale of 700 million kyats in government securities
 - ▶ Calculate by how much the individual components of the CBM balance sheet changed between 2011 /12 and 2012 /13
- Can the above transactions explain part of the actual changes? What likely happened?





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Changes in the CBM Balance Sheet (continued)

Difference CBM Balance Sheet 2012/13 - 2011/12

Assets	1,261.4	Liabilities	1,260.0
<i>Net foreign assets</i>	<i>850.4</i>	<i>Reserve money</i>	<i>1,260.0</i>
Foreign assets	2,390.0	Currency in circulation	899.0
Foreign liabilities	1,539.6	Deposits of commercial banks with CBM	361.0
<i>Net domestic assets</i>	<i>411.0</i>		
Domestic credit	-174.0		
Claims on central government (net)	-713.0		
Claims on commercial banks	539.0		
Other	0.0		
Other items net	585.0		



I.C ကူးသန်းရောင်းဝယ်ရေးဘဏ်စာရင်း

တချို့သော လုပ်ဆောင်ချက်:

- ▶ ငွေအပ်နှံခြင်းဖြင့် ငွေစုခြင်းကို ဖြစ်စေသည်
- ▶ ငွေအပ်နှံခြင်းကို ငွေချေးခြင်းဖြင့် အသွင်ပြောင်းခြင်း
- ▶ ကူးသန်းရောင်းဝယ်ရေးဘဏ်များသည် ငွေကြေးမူဝါဒကို တဆင့်ပေးပို့ရန် အရေးပါသည်။



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Analytical Balance Sheet of Commercial Banks

Assets	Liabilities
Net foreign assets (NFA)	Deposits
Net domestic assets (NDA)	Demand deposits
Claims on the central bank	Time and saving deposits
○ Currency held in vaults	Foreign currency deposits
○ Deposits at the central bank	Liabilities to the central bank
Domestic credit	
○ Net credit to the government	
○ Credit to private sector	
Other items net	



Commercial Bank Balance Sheet Example

Central bank sells Kyat 100 in treasury bills to commercial banks:

Commercial Bank Balance Sheet

Assets		Liabilities	
Net Foreign Assets	...	Deposits	...
Net Domestic Assets	0	Demand deposits	...
Claims on central bank	-100	Time and saving deposits	...
Currency held in vaults		Foreign currency deposits	...
Reserves	-100	Liabilities to the central bank	...
Domestic credit	+100		
To the government	+100		
To other resident sector	...		
Other items net	...		



Commercial Bank Balance Sheet Example (cont.)

Central bank sells Kyat 100 in treasury bills to ODCs:

Central Bank Balance Sheet

Assets		Liabilities	
Net Foreign Assets	...	Reserve money (RM)	-100
Net Domestic Assets	-100	Currency issued	...
Net claims on the gov.	-100	Held in banks	...
Claims on commercial banks	...	Held outside banks	...
Claims on other res. sector	...	Deposits of commercial banks	-100
Other items net	...	Other deposits	...



Exercises for Commercial Bank Balance Sheet

Exercise 3:

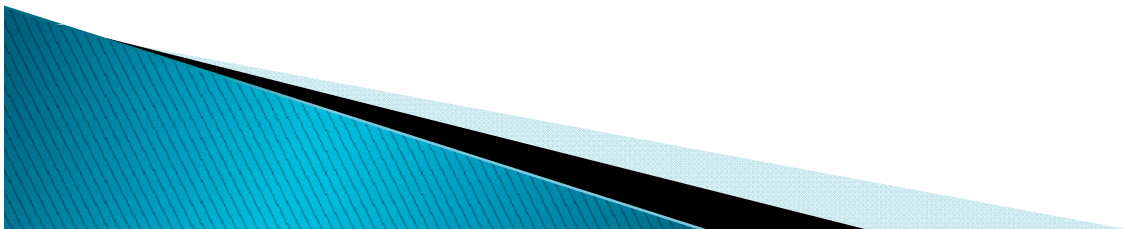
- ▶ Replicate this example in the provided Excel spreadsheet

Exercise 4: what other options does the central bank have to reduce reserve money?

- ▶ Consider foreign exchange sales

Exercise 5:

- ▶ Work through the balance sheet implications of the direct provision of credit by the central bank to commercial banks

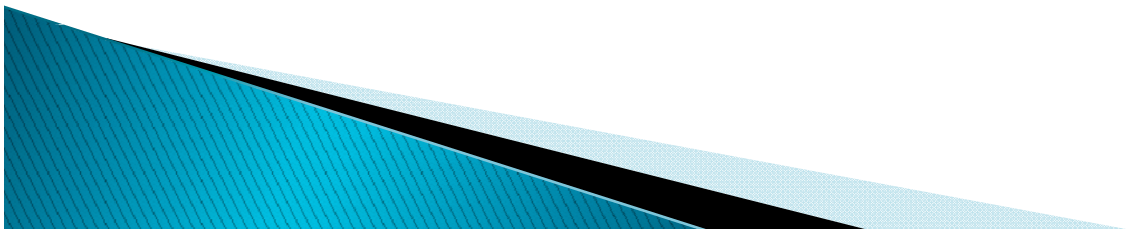




I.D ငွေကြေးဆန်းစစ်မှု

ဘဏ်စနစ်အတွက် စုစည်းထားသော ငွေစာရင်းရှင်းတန်း :

- ▶ Add up balance sheets for the central bank and commercial banks, but ...
- ▶ ... before doing so, consolidate common items on the two balance sheets!





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Consolidation of Central Bank & Commercial Bank Balance Sheets

Central Bank	
Assets	Liabilities
Net Foreign Assets	Reserve money (RM)
Net Domestic Assets	Currency issued
Net claims on the government	Held in banks
Claims on commercial banks	Held outside banks
Claims on other resident sector	Deposits of commercial banks
Other items net	Other deposits
Commercial Banks	
Assets	Liabilities
Net Foreign Assets	Deposits
Net Domestic Assets	Demand deposits
Claims on the central bank	Time and saving deposits
Currency held in vaults	Foreign currency deposits
Deposits at the central bank	Liabilities to the central bank
Domestic credit	
Other items net	



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Central Bank	
Assets	Liabilities
Net Foreign Assets	Reserve money (RM)
Monetary survey	
Assets	Liabilities
Claims on commercial banks	Field outside banks
Net Foreign Assets	Broad money (M2)
Claims on other residential sector	Deposits of commercial banks
Of the central bank	Narrow money (M1)
Other items net	Other deposits
Of the commercial banks	Currency in circulation
Net Domestic Assets	Demand deposits
Commercial Banks	
Net credit to the government	Quasi money
Assets	Liabilities
Credit on the other resident sector	Time and saving deposits
Net Foreign Assets	Deposits
Other items net	Foreign currency deposits
Net Domestic Assets	Demand deposits
Claims on the central bank	Time and saving deposits
Currency held in vaults	Foreign currency deposits
Reserve deposits at the central bank	Liabilities to the central bank
Domestic credit	
Other items net	



Exercise 6

Consolidate the central bank and commercial bank balance sheets in exercise 2 and create the corresponding monetary survey!

Monetary Survey			
Assets	590.0	Liabilities	590.0
<i>Net foreign assets</i>	<i>370.0</i>	<i>Broad money (M2)</i>	<i>590.0</i>
Foreign assets	370.0	<i>Narrow money (M1)</i>	<i>430.0</i>
Foreign liabilities	0.0	Currency in circulation	180.0
<i>Net domestic assets</i>	<i>220.0</i>	Demand deposits	250.0
Domestic credit	220.0	<i>Quasi money</i>	<i>160.0</i>
Claims on central government (net)	20.0	Time and saving deposits	110.0
Credit to private sector	200.0	Foreign currency deposits	50.0
Other items net	0.0		
Assets=Liabilities			
		Assets	590.0
		Liabilities	590.0
		Should be the same	



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Monetary Survey in Myanmar

Table 4. Myanmar: Monetary Survey, 2009/10-2013/14 1/ 2/
 (In billions of kyat at end-period, unless otherwise indicated)

	2009/10	2010/11	2011/12	Feb-13	2012/13 Est.	2013/14 Proj.
CENTRAL BANK OF MYANMAR (CBM)						
Net foreign assets	-1.6	-1.6	-1.4	848	337	1,217
Foreign assets	2.9	2.9	3.0	2,393	1,962	2,919
Foreign liabilities	4.5	4.5	4.4	1,544	1,625	1,702
Net domestic assets	5,365	7,003	7,553	7,963	10,067	10,819
Domestic credit	5,518	7,162	7,851	7,677	9,323	10,087
Claims on central government (net)	5,476	6,883	7,673	6,960	8,573	9,087
Claims on deposit money banks	42	279	178	717	750	1,000
Other	0	0	0	0	0	0
Other items net	-153	-159	-299	286	744	732
Reserve money	5,363	7,001	7,551	8,812	10,405	12,036
Currency in circulation	4,232	5,227	6,070	6,969	8,324	9,629
Deposits	1,131	1,774	1,481	1,842	2,081	2,407
MONETARY SURVEY						
Net foreign assets	4	6	25	3,411	3,057	4,017
Foreign assets	26	30	49	7,677	7,412	8,719
Foreign liabilities	22	24	24	4,266	4,355	4,702
Net domestic assets	7,301	9,951	12,548	16,423	18,751	23,004
Domestic credit	7,700	10,348	12,948	11,879	14,083	17,739
Net claims on government	6,466	8,310	9,688	3,979	5,573	6,856
CBM	5,476	6,883	7,673	6,960	8,573	9,087
Deposit money banks	990	1,427	2,015	-2,981	-3,000	-2,231
Credit to the economy	1,234	2,038	3,260	7,900	8,510	10,883
Private sector	1,229	2,033	3,255	4,697	4,894	6,682
Other	5	5	5	3,203	3,617	4,201
Other items net	-399	-397	-400	4,543	4,667	5,265
Broad money	7,305	9,957	12,573	19,833	21,808	27,021
Currency outside banks	4,009	4,825	5,563	6,235	6,761	7,836
Deposits	3,296	5,132	7,010	13,598	15,048	19,185



Monetary Survey and “Money”

Why is M2 “money”?

Because it is what the economy can use to make payments and economic transactions:

- Currency in circulation: “cash”
- deposits constitute a means of payment, as one can write checks (not so common in Myanmar), or make transfers, or withdraw cash against deposits (almost) upon demand



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Is the Monetary Survey All We Need to Understand “Money”?

No!

- Monetary survey does not exist in a vacuum
 - Link to other sectors
- In our exercises, private sector deposits and credit to private sector was completely unaffected by any changes to central bank balance sheet
 - This is not right!
 - Endogenous money creation





II. ငွေကြေးဖန်တီးမှု

- တခြားကဏ္ဍ၏ ငွေကြေးဆန်းစစ်မှုအပေါ် အကျိုးသက်ရောက်မှု
 - ✓ ပြင်ပကဏ္ဍ
 - ✓ ဘဏ္ဍာရေးကဏ္ဍ
- Endogenous money creation



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II.A Impact of Other Sectors on Monetary Survey

External Sector

Monetary survey

Assets

Net foreign assets

Accumulation of foreign
reserves in BOP

“money flowing in from
abroad”

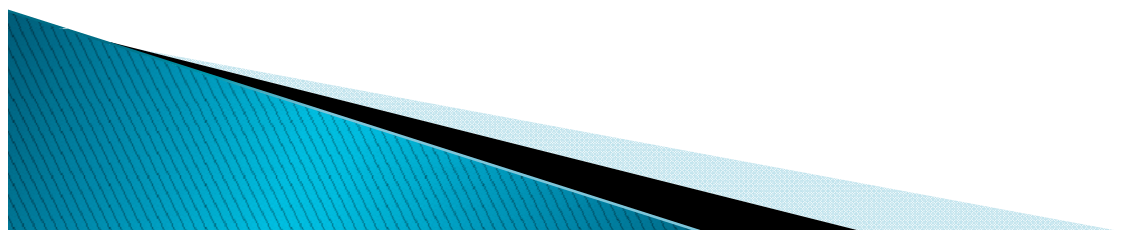
→ NFA ↑

Liabilities

→ Currency in
circulation

→ Deposits

→ M1 & M2





Fiscal Sector

Monetary survey

Assets

Net domestic assets

E.g., increase in fiscal spending
that is bank-financed

“government injects
liquidity into economy by
buying goods and services”



Net credit to government increases

→ NDA ↑

Liabilities

→ Currency in
circulation

→ Deposits

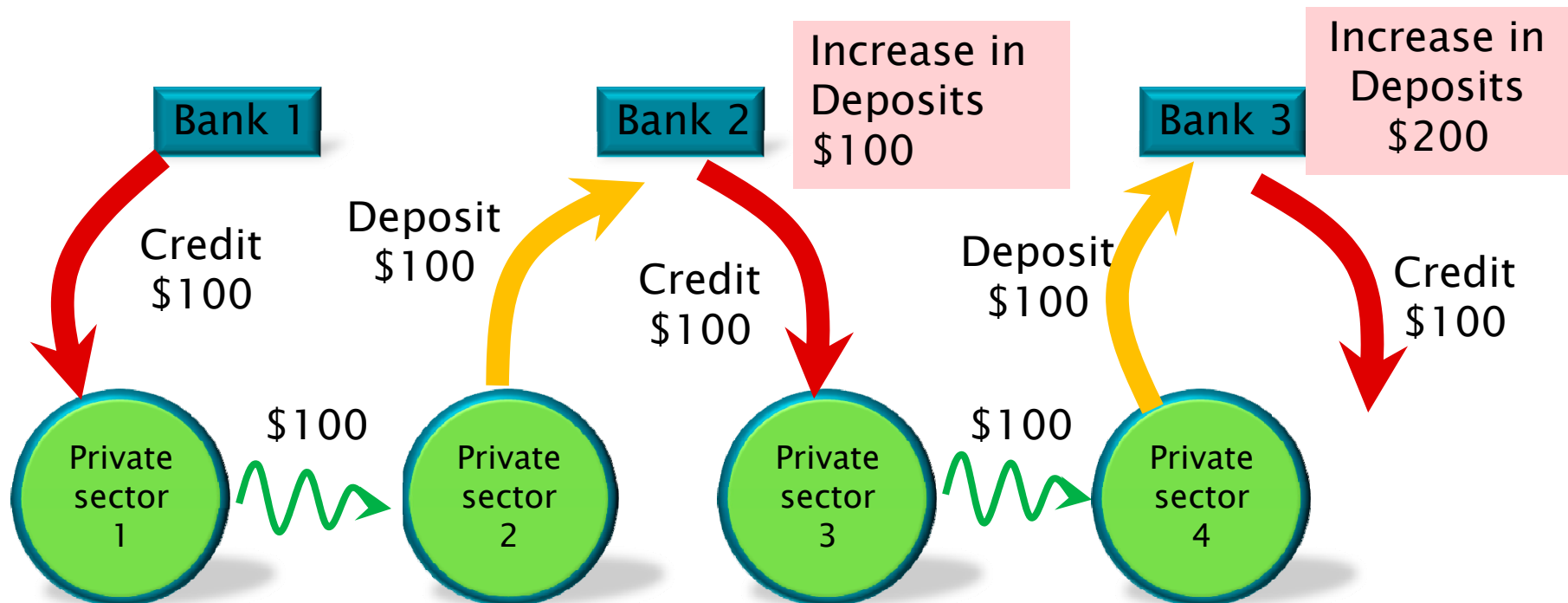
→ M1 & M2





II.B Endogenous Money Creation

Example for boundless endogenous money creation: a bank extends credit of Kyat 100, which fuels further deposit and credit creation ...





Limiting Money Creation through Reserve Requirements & Currency Demand

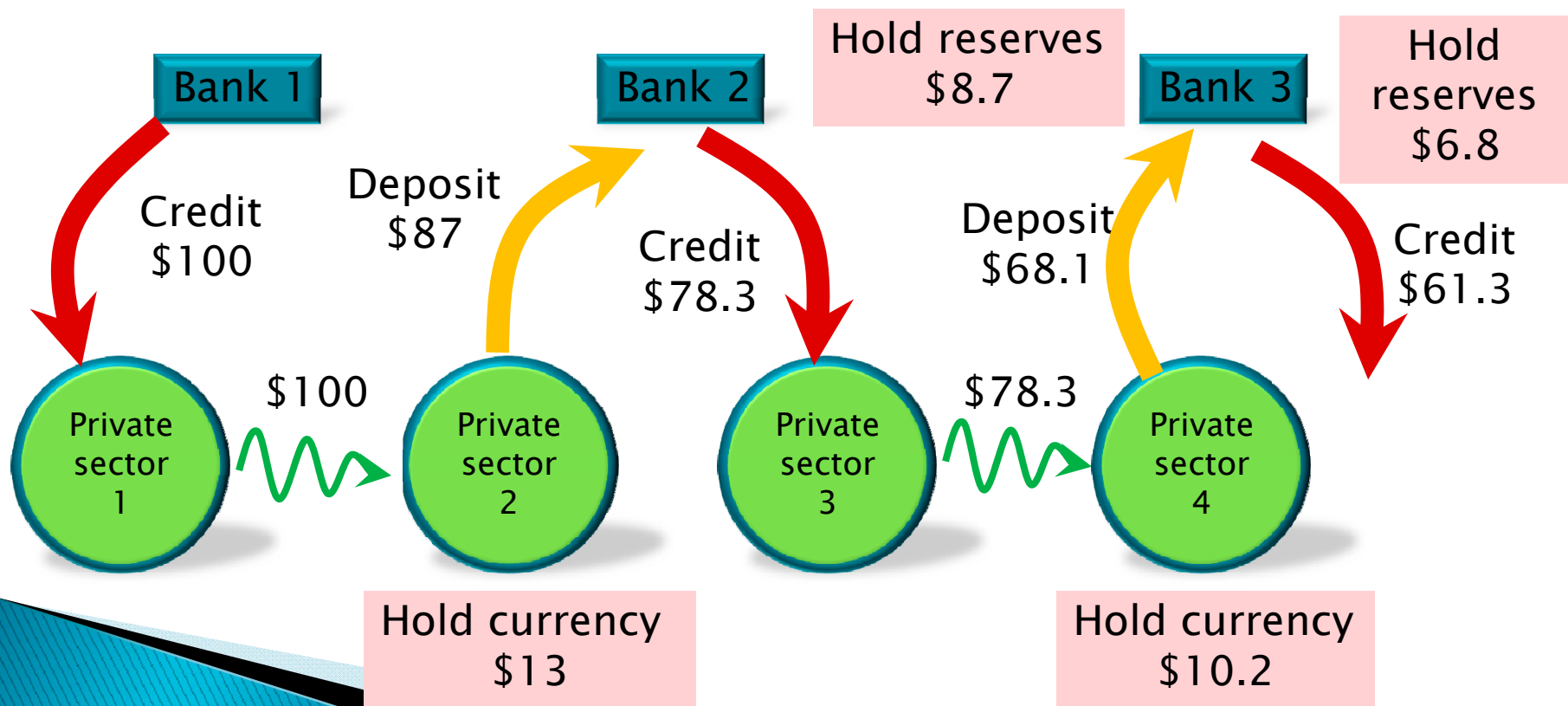
Adding more detail to the Central Bank Balance Sheet:

Net foreign assets (NFA)	Reserve money (RM)
Net domestic assets (NDA)	Currency issued
Net claims on the government (NCG)	Reserves of commercial banks with central bank (deposits with CB)
Claims on commercial banks	Required reserves
Claims on other resident sectors	Excess reserves
Other items net	Other deposits



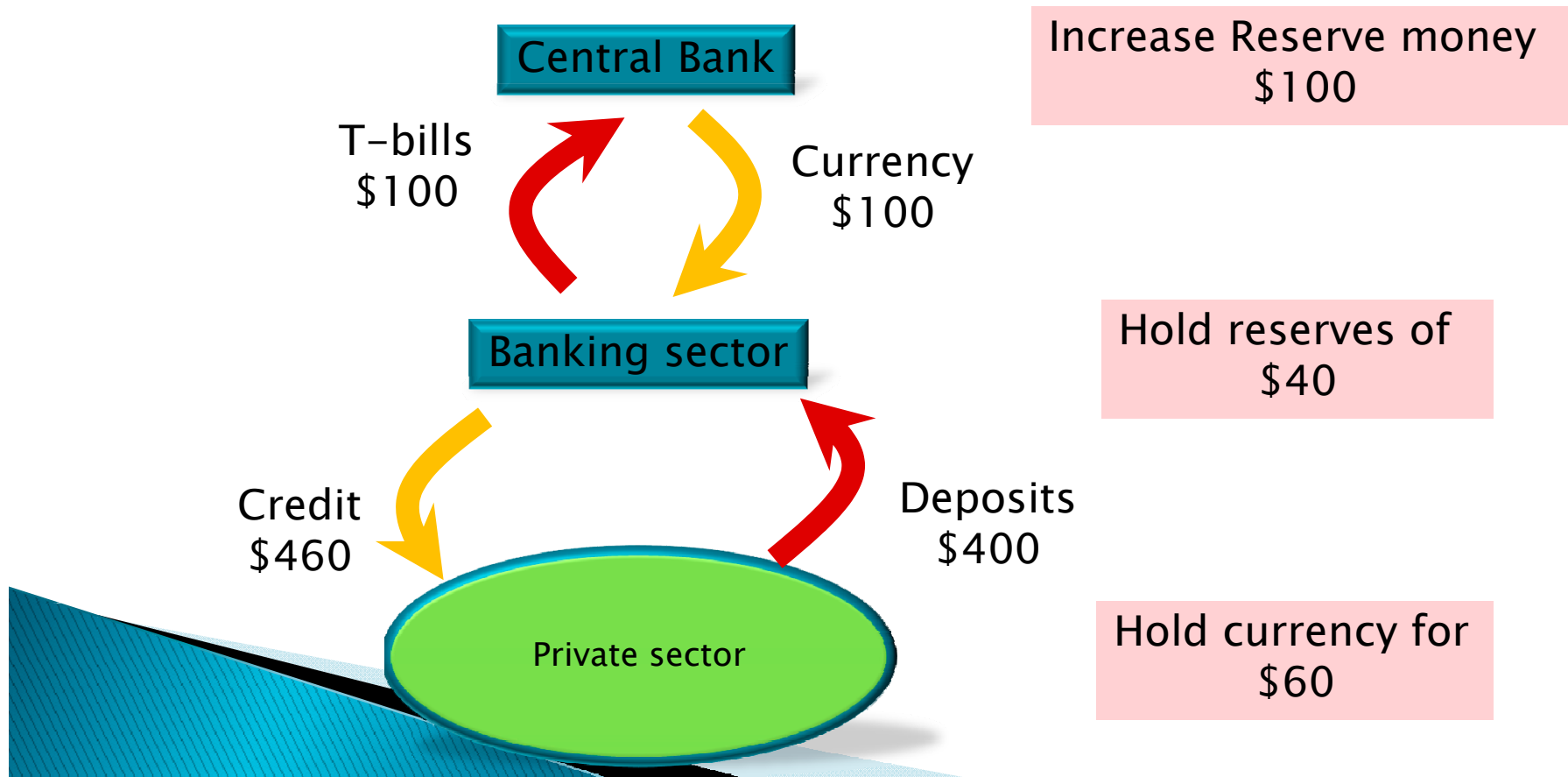
Limiting Money Creation through Reserve Requirements & Currency Demand

Now: a bank extends credit of Kyat 100 with 10% reserve requirements and currency-to-deposit ratio of 15 %





End-result: increase in reserve money by Kyat 100 leads to increase in broad money by Kyat 460 (deposits 400 + currency 60). That is, increase in broad money exceeds increase in reserve money by factor of 4.6!

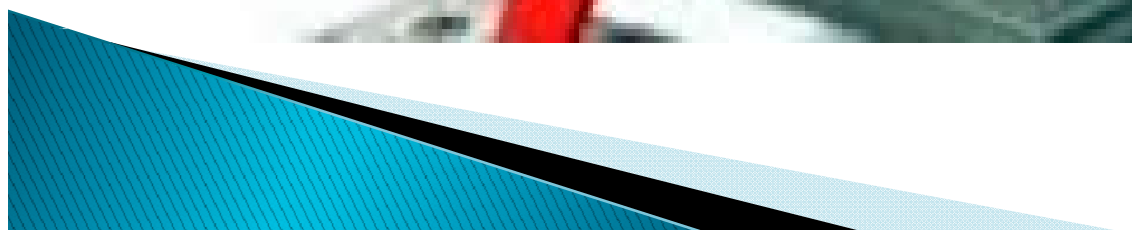




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The Money Multiplier





Deriving the Money Multiplier

The extent of endogenous money creation is governed by the money multiplier which links broad money (M2) to reserve money (RM):

$$M2 = m \cdot RM$$

$$m = \frac{M2}{RM} = \frac{C + D}{C + R} = \frac{\frac{C}{D} + \frac{D}{D}}{\frac{C}{D} + \frac{R}{D}} = \frac{c + 1}{c + r}$$

where C = currency in circulation, R = Reserves held at CB (commercial bank deposits at CB) and D = deposits of private sector with commercial banks).

The money multiplier is a function of

- c = currency-to-deposits ratio (behavioral variable)
- r = reserve-to-deposits ratio (policy variable)



The Money Multiplier (continued)

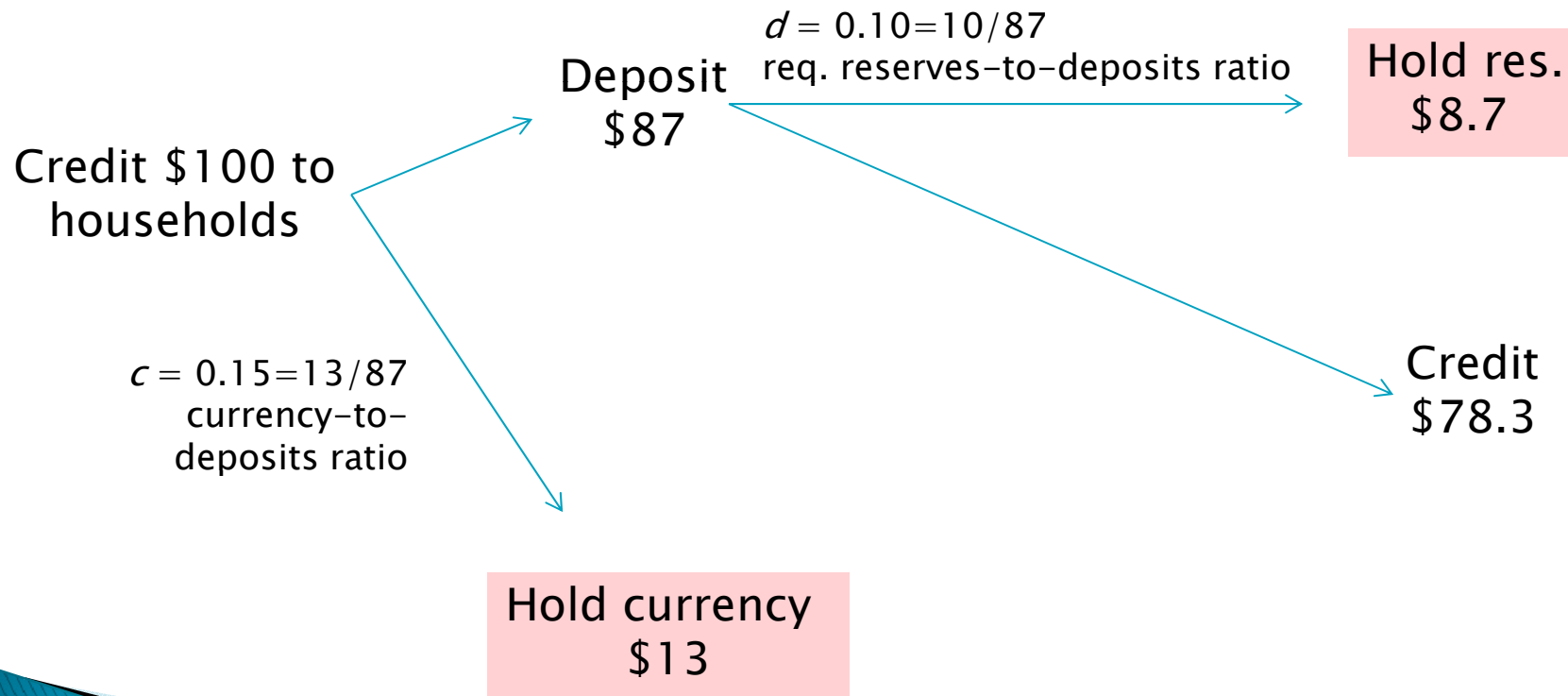
Fundamental determinants of the money multiplier:

- reserve requirements decided by the central bank → matters for reserve-to-deposits ratio
- Willingness of banks to hold excess reserves (liquidity risks, credit risk, foregone interest earnings) → matters for reserve-to-deposits ratio
- Willingness of households and firms to hold cash instead of deposits (liquidity risks, foregone interest earnings) → matters for currency-to-deposits ratio



Exercise 7

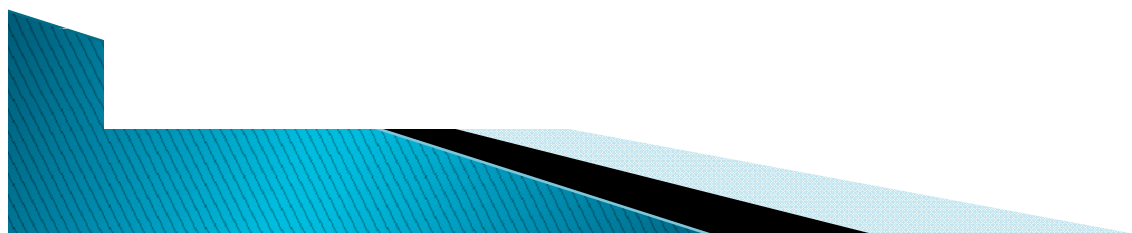
Replicate this process in the supplied Excel spreadsheet in order to verify that the money multiplier indeed summarizes the endogenous money creation process!





IV. Summary

- ▶ Monetary accounts are critical for analysis of monetary conditions and formulation as well as implementation of monetary policy
- ▶ Money creation is partly linked to developments in other sectors and partly an endogenous process that can be influenced by monetary policy





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Thank You!

This presentation provides you with a basic introduction to the monetary accounts that we will put into practice soon!

