

# Monetary Statistics & Money Supply

မြန်မားသပ်ချက်

Jan Gottschalk  
TAOLAM

This training material is the property of the IMF – Singapore Regional Training Institute (STI) and is intended for the use in STI courses. Any reuse requires the permission of the STI.



Central Bank of Myanmar - TAOLAM  
“Introduction to Financial Programming”  
December 16-20, 2013 Yangon, Myanmar



# မြန်မာ့သုံးသပ်ချက်

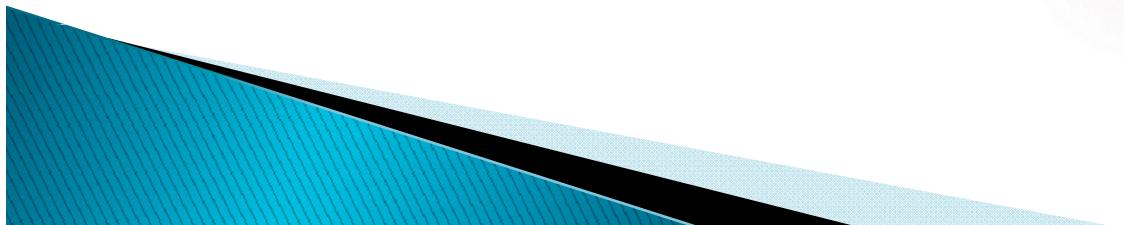
- I. Monetary Statistics
- II. Money Creation
- III. Summary





# I. Monetary Statistics

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





# I. Monetary Statistics

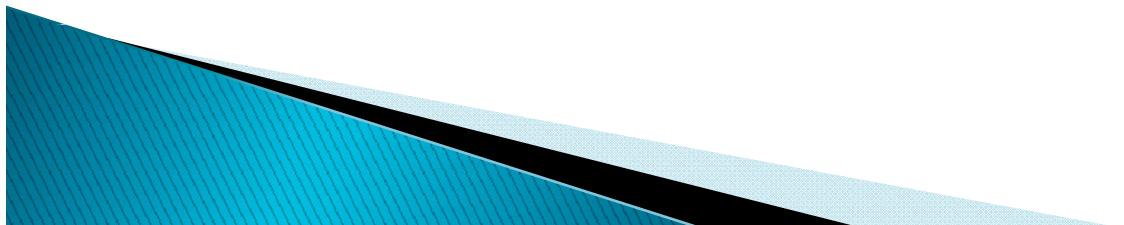
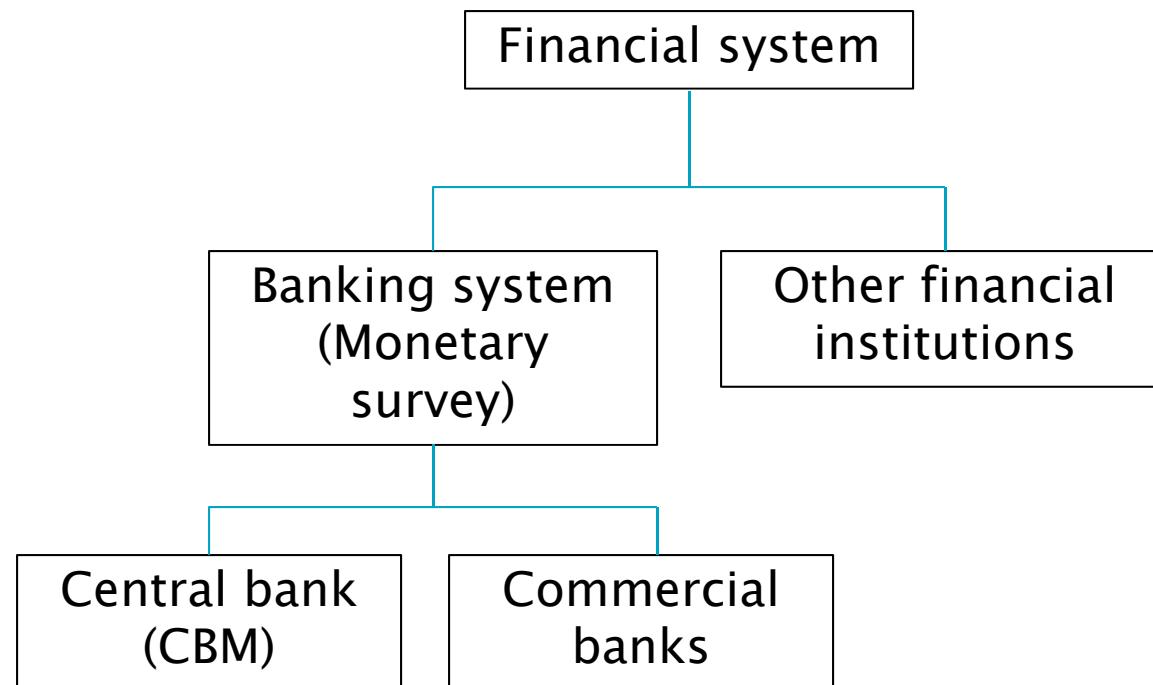


**Monetary statistics accounts are critical for analysis of monetary conditions and formulation as well as implementation of monetary policy**

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

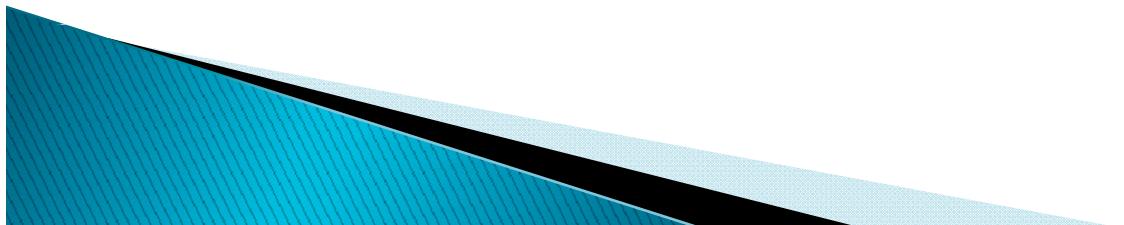
- ▶ Central bank = CBM
- ▶ Commercial banks =
  - ✓ State-owned commercial banks  
(MEB, MFTB, MICB, MADB)
  - ✓ Private commercial banks
- ▶ Other financial institutions =
  - ✓ Microfinance institutions
  - ✓ Financial leasing companies  
(Oriental Leasing Co. Ltd.)
  - ✓ Insurance companies (Myanmar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



## I.B ပဟိုဘဏ်စာရင်း

ပဟိုဘဏ်၏ B/S ကို တိုက်ရိုက်အကျိုးသက်ရောက်မှုရှိသော  
လုပ်ဆောင်ချက်များ

- ✓ ငွေကြေးထုတ်ခြင်း
- ✓ ငွေကြေးစည်းမျဉ်းချမှတ်ခြင်း(ငွေကြေးမူပါဒ)
- ✓ အစိုးရ၏ Banker အရလုပ်ဆောင်ရခြင်း
- ✓ တိုင်းပြည်၏နိုင်ငံ့ခြားအရန်ငွေကို ကိုင်ထားရခြင်း  
(ငွေလျှန်းမူပါဒ)





## Analytical Balance Sheet of CB

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

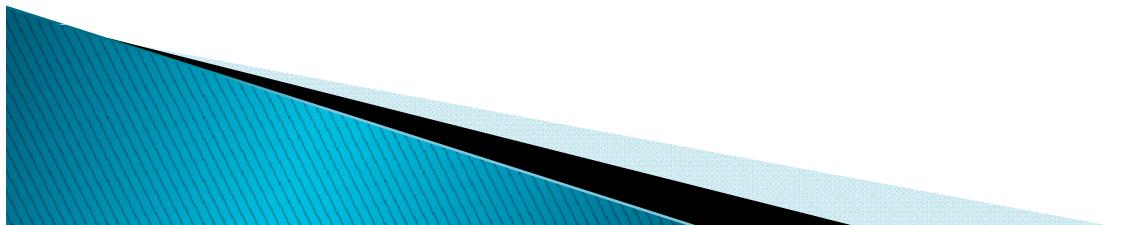
Net foreign assets (NFA)	Reserve money (RM)
Net domestic assets (NDA)	Currency issued
Net claims on the government (NCG)	Held in banks
Claims on commercial banks	Held outside banks
Claims on other resident sectors	Deposits (reserves) of commercial banks with central bank
Other items net	Other deposits



## 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)

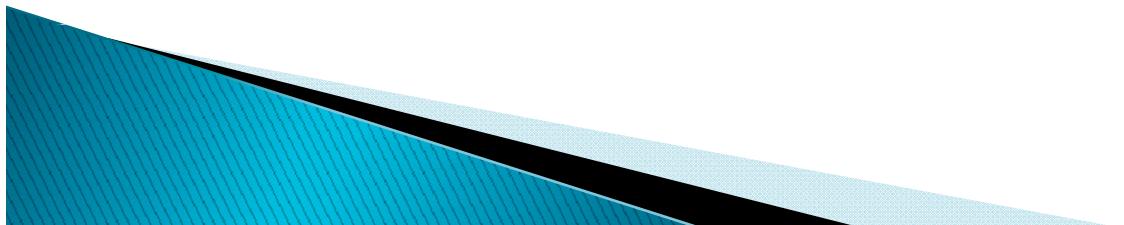




## Analytical Balance Sheet of CB (continued)

### Liabilities

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

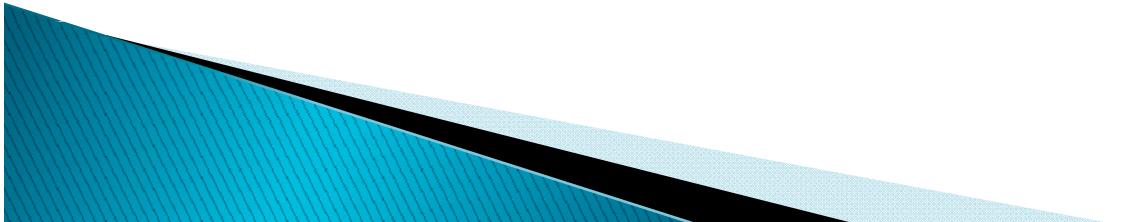




## အဘယ်ကြောင့် အရန်ငွေသည် အရေးပါသနည်း

➤ပဟိုဘက်သည် အရန်ငွေကို ထိန်းချုပ်ရရသည်။ 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)

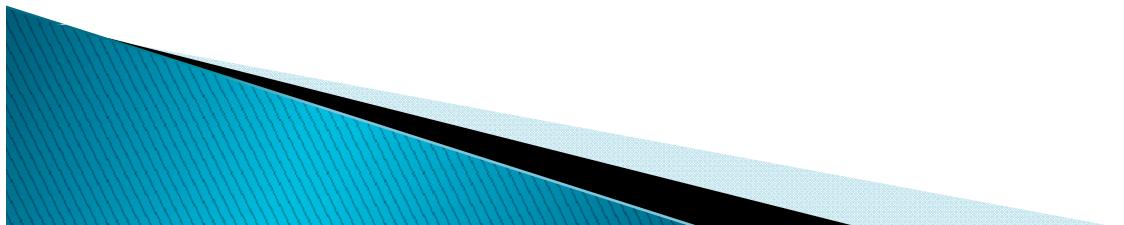




## CBM B/S ၏ အစိတ်အပိုင်းများ

### Exercise 1:

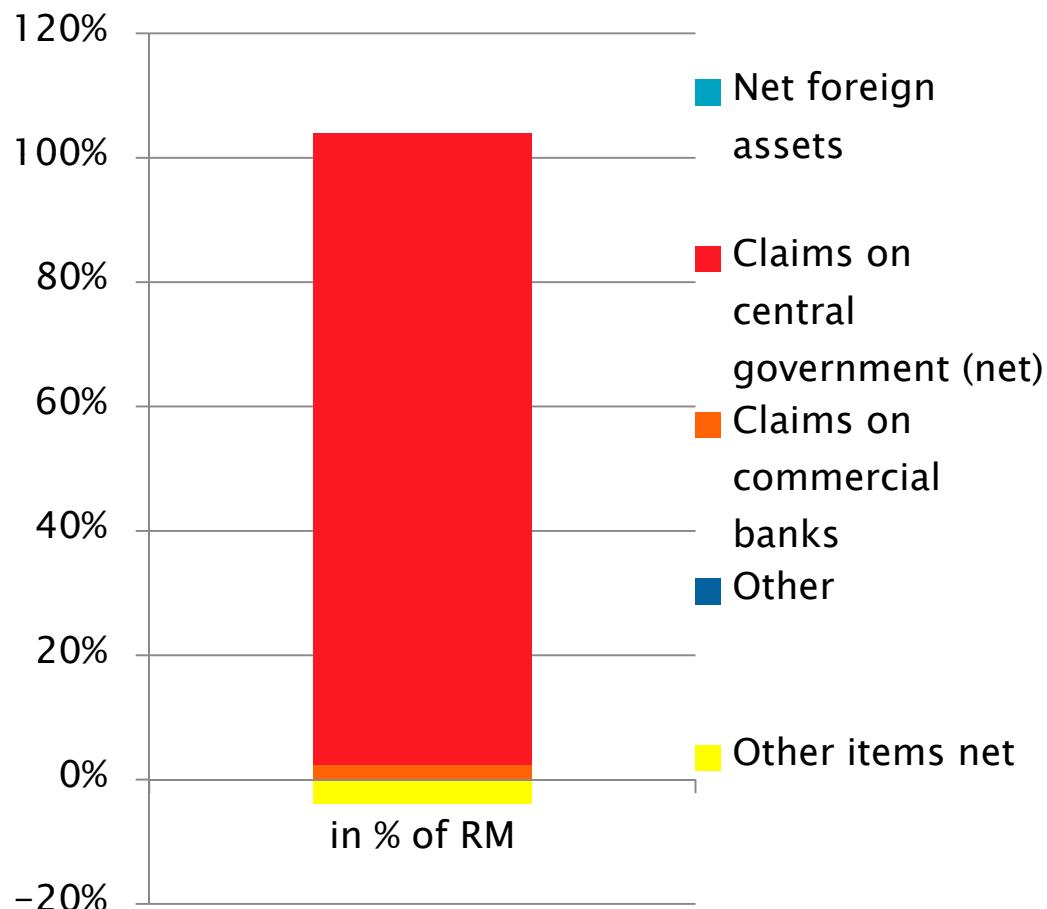
- ▶ Use monetary table in Article IV report to portray the CBM balance sheet for 2011/12 in the form depicted in the previous slide
- ▶ Analyze the relative importance of the individual asset and liability components by expressing them in percent of reserve money
- ▶ How does the composition of the CBM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



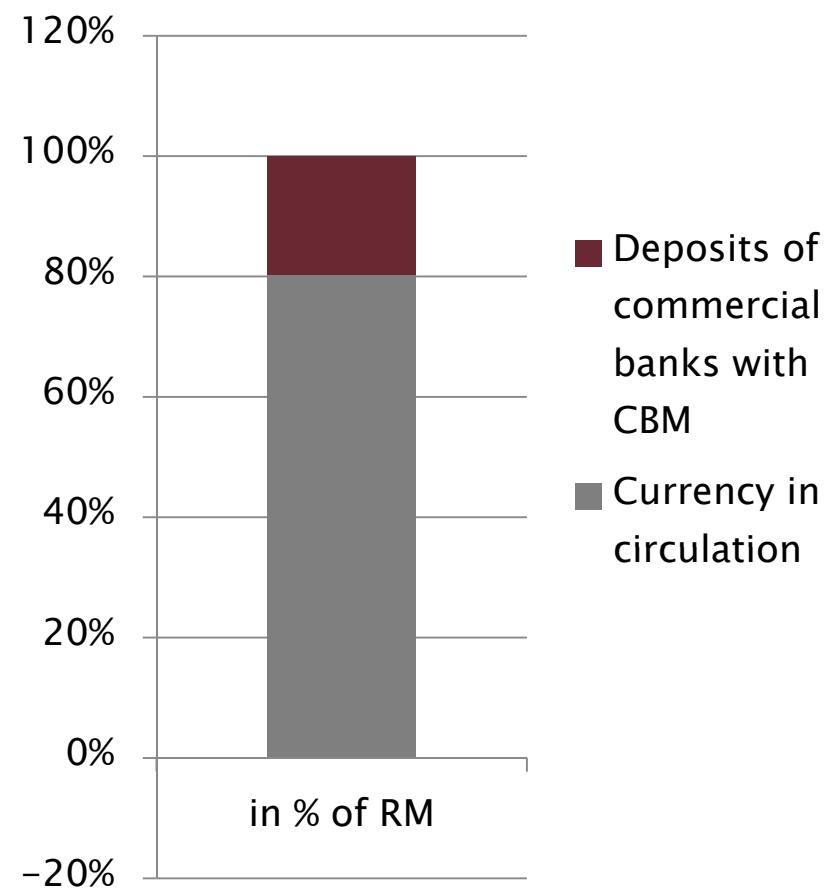


## Main Components of CBM Balance Sheet (continued)

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



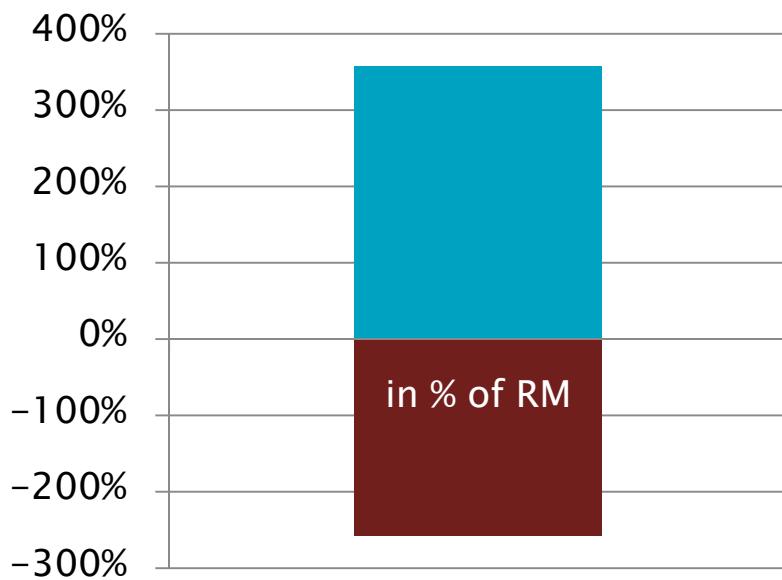
Composition of Reserve Money –  
CBM Liabilities (in % of RM)





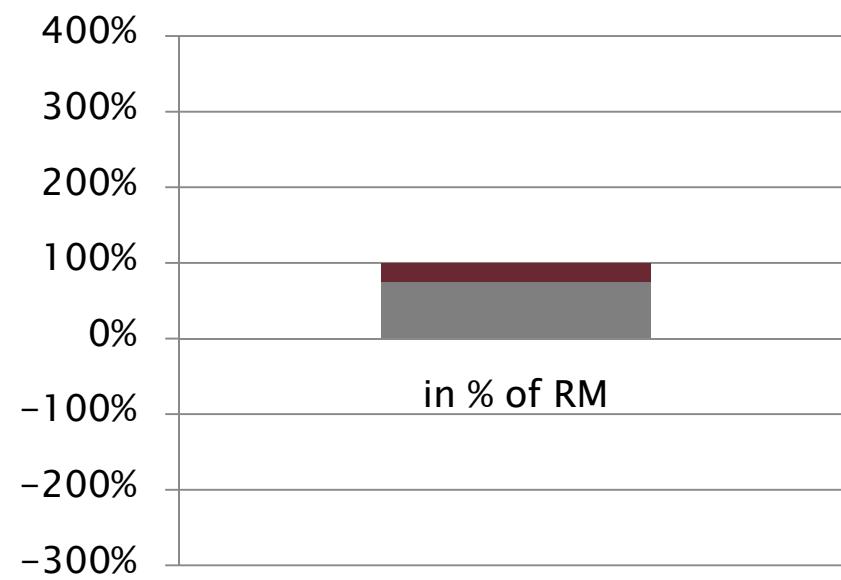
## Main Components of CBM Balance Sheet—How Does This Compare with Composition of Bank of Thailand Balance Sheet?

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

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

<u>Assets</u>		<u>Liabilities</u>	
<b>CB's NFA</b>	<b>100</b>	<b>Base money</b>	<b>70</b>
Foreign exchange	100		
<b>CB's NDA</b>	<b>-30</b>		
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?



Central Bank of Myanmar - TAOLAM  
“Introduction to Financial Programming”  
December 16-20, 2013 Yangon, Myanmar



## Changes in the CBM Balance Sheet (continued)

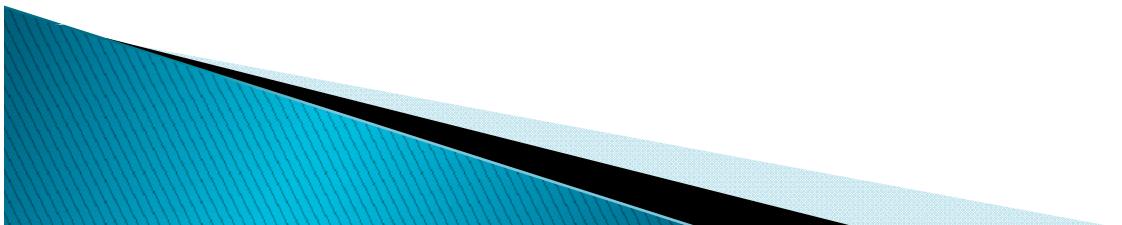
Difference CBM Balance Sheet 2012/13 - 2011/12			
Assets	1,261.4	Liabilities	1,260.0
<i>Net foreign assets</i>	850.4	<i>Reserve money</i>	1,260.0
Foreign assets	2,390.0	Currency in circulation	899.0
Foreign liabilities	1,539.6	Deposits of commercial banks with CBM	361.0
 <i>Net domestic assets</i>	 411.0		
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:

- ▶ ငွေအပ်နံခြင်းဖြင့် ငွေစုခြင်းကို ဖြစ်စေသည်
- ▶ ငွေအပ်နံခြင်းကို ငွေချေးခြင်းဖြင့် အသွေ်ပြောင်းခြင်း
- ▶ ကူးသန်းရောင်းဝယ်ရေးဘဏ်များသည် ငွေကြေးပူပါဒကို တဆင့်ပေးပို့ရန် အရေးပါသည်။





## Analytical Balance Sheet of Commercial Banks

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



## 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:

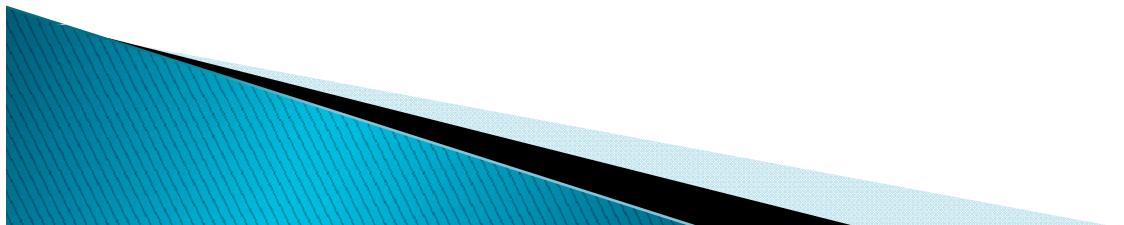
- ▶ Work through the balance sheet implications of the direct provision of credit by the central bank to commercial banks



## I.D ငွေကြေးဆန်းစစ်ပူ

ဘဏ်စနစ်အတွက် စုစုပေါင်းထားသော ငွေတရ်းရှင်းတန်း :

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





## Consolidation of Central Bank & Commercial Bank Balance Sheets

Central Bank	
Assets	Liabilities
<b>Net Foreign Assets</b>	<b>Reserve money (RM)</b>
<b>Net Domestic Assets</b>	<b>Currency issued</b>
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
<b>Net Foreign Assets</b>	<b>Deposits</b>
<b>Net Domestic Assets</b>	Demand deposits
Claims on the central bank	Time and saving deposits
Currency held in vaults	Foreign currency deposits
Deposits at the central bank	<b>Liabilities to the central bank</b>
Domestic credit	
Other items net	



Central Bank of Myanmar - TAOLAM  
“Introduction to Financial Programming”  
December 16-20, 2013 Yangon, Myanmar



Central Bank	
Assets	Liabilities
<b>Net Foreign Assets</b>	<b>Reserve money (RM)</b>
Monetary survey	
Assets	Liabilities
Claims on commercial banks	Held outside banks
<b>Net Foreign Assets</b>	<b>Broad money (M2)</b>
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
<b>Net Domestic Assets</b>	<b>Commercial Banks</b>
Net credit to the government	Demand deposits
Assets	Quasi money
Credit on the other resident sector	Liabilities
<b>Net Foreign Assets</b>	Time and saving deposits
Other items net	Deposits
<b>Net Domestic Assets</b>	Foreign currency deposits
Claims on the central bank	Demand deposits
Currency held in vaults	Time and saving deposits
Reserve deposits at the central bank	Foreign currency deposits
Domestic credit	Liabilities to the central bank
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		
Foreign liabilities	0.0	<i>Narrow money (M1)</i>	430.0
		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>	160.0
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			



Central Bank of Myanmar - TAOLAM  
“Introduction to Financial Programming”  
December 16-20, 2013 Yangon, Myanmar



## 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	2013/14
					Est	Proj
<b>CENTRAL BANK OF MYANMAR (CBM)</b>						
<b>Net foreign assets</b>	<b>-1.6</b>	<b>-1.6</b>	<b>-1.4</b>	<b>848</b>	<b>337</b>	<b>1,217</b>
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
<b>Net domestic assets</b>	<b>5,365</b>	<b>7,003</b>	<b>7,553</b>	<b>7,963</b>	<b>10,067</b>	<b>10,819</b>
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
<b>Reserve money</b>	<b>5,363</b>	<b>7,001</b>	<b>7,551</b>	<b>8,812</b>	<b>10,405</b>	<b>12,036</b>
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
<b>MONETARY SURVEY</b>						
<b>Net foreign assets</b>	<b>4</b>	<b>6</b>	<b>25</b>	<b>3,411</b>	<b>3,057</b>	<b>4,017</b>
Foreign assets	26	30	49	7,677	7,412	8,719
Foreign liabilities	22	24	24	4,266	4,355	4,702
<b>Net domestic assets</b>	<b>7,301</b>	<b>9,951</b>	<b>12,548</b>	<b>16,423</b>	<b>18,751</b>	<b>23,004</b>
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
<b>Broad money</b>	<b>7,305</b>	<b>9,957</b>	<b>12,573</b>	<b>19,833</b>	<b>21,808</b>	<b>27,021</b>
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



dreamstime.com



# 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. ငွေကြေးဖန်တီးပူ

➤ တွေားကဏ္ဍ၏ ငွေကြေးဆန်း  
စစ်ပုဒ်အပေါ် အကျိုးသက်ရောင်း

မူ

✓ ပြင်ပကဏ္ဍ

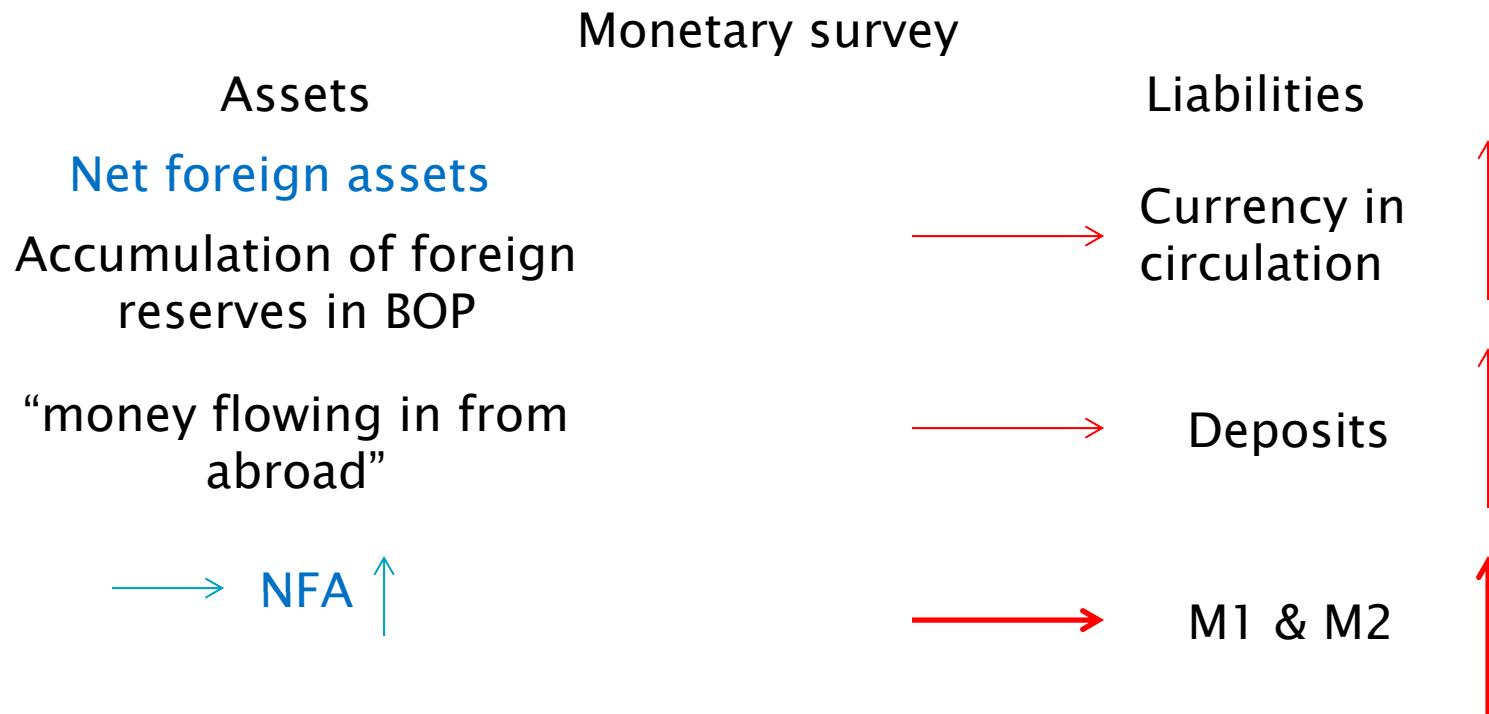
✓ ဘဏ္ဍာရေးကဏ္ဍ

➤ Endogenous money  
creation



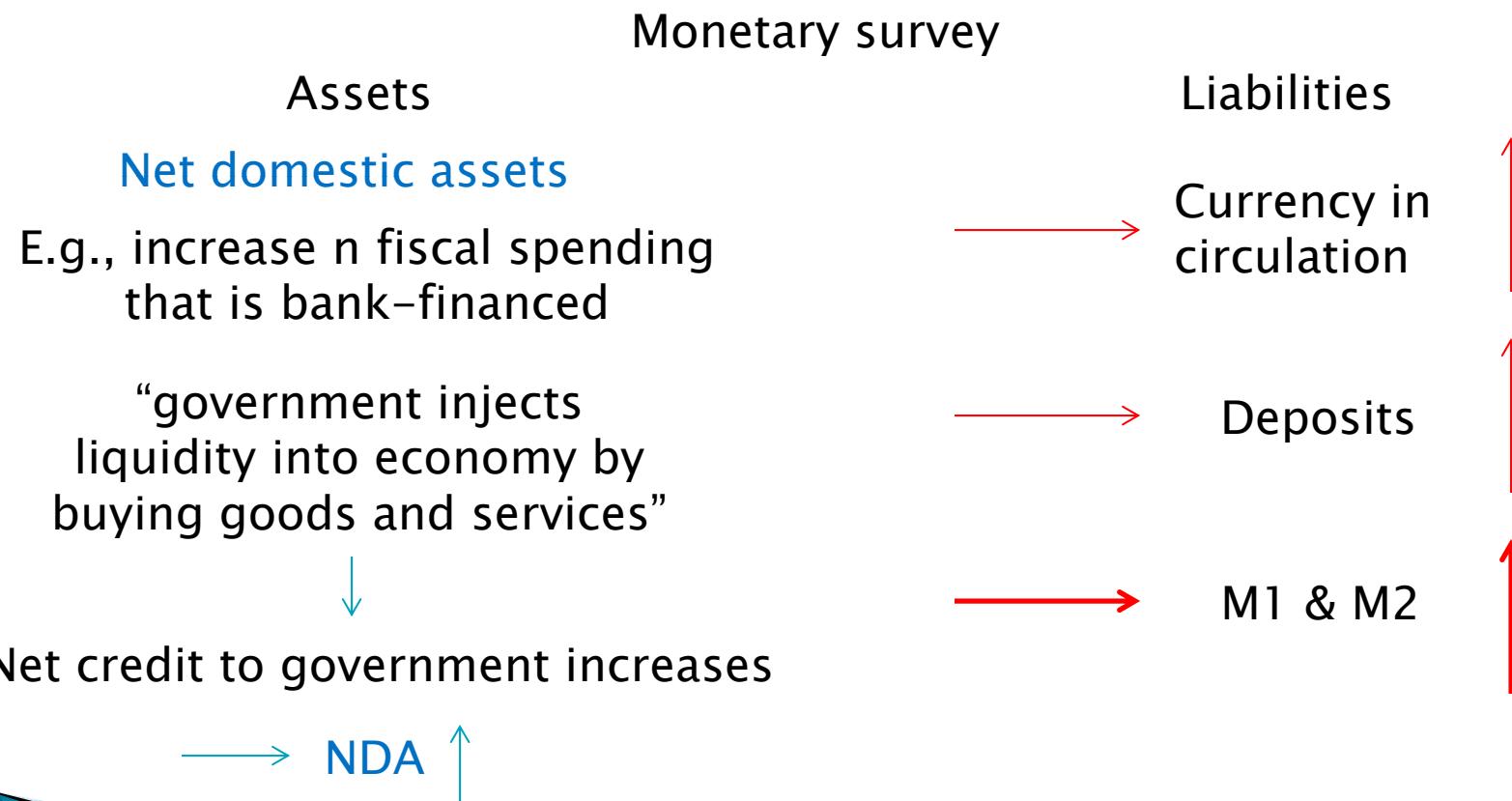


## II.A Impact of Other Sectors on Monetary Survey External Sector





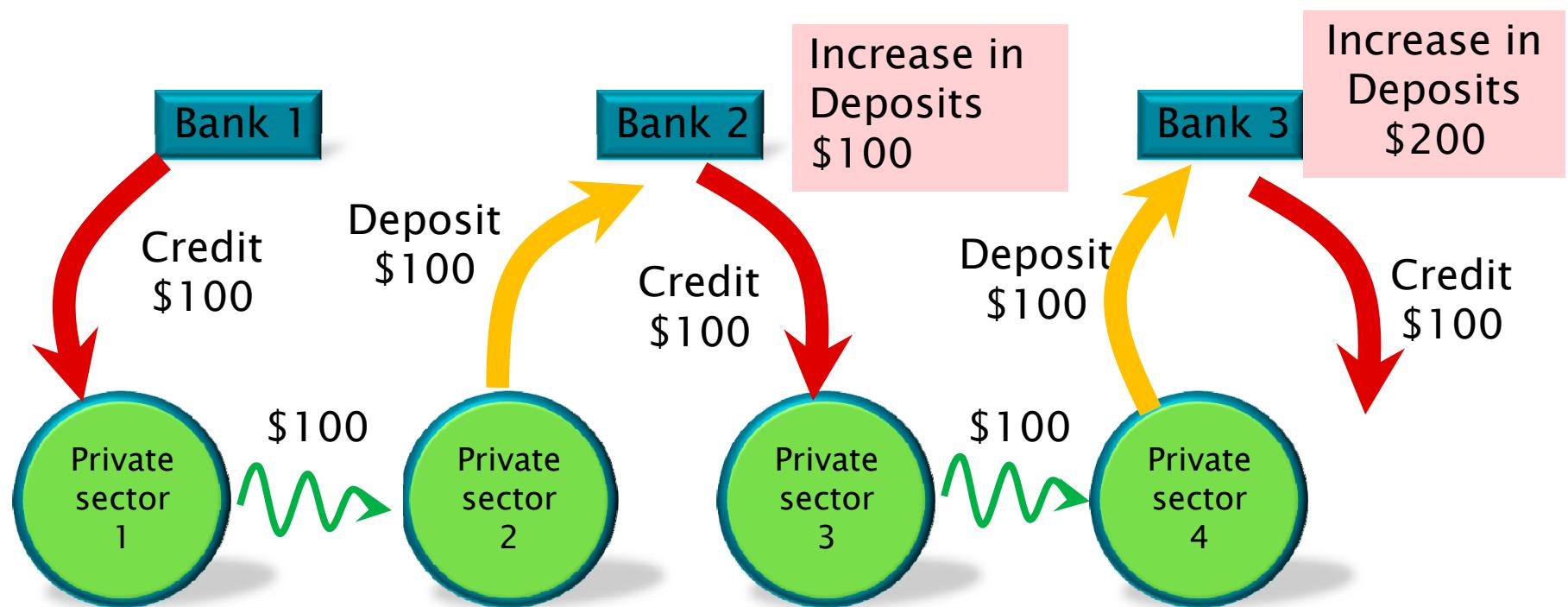
## Fiscal Sector





## 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

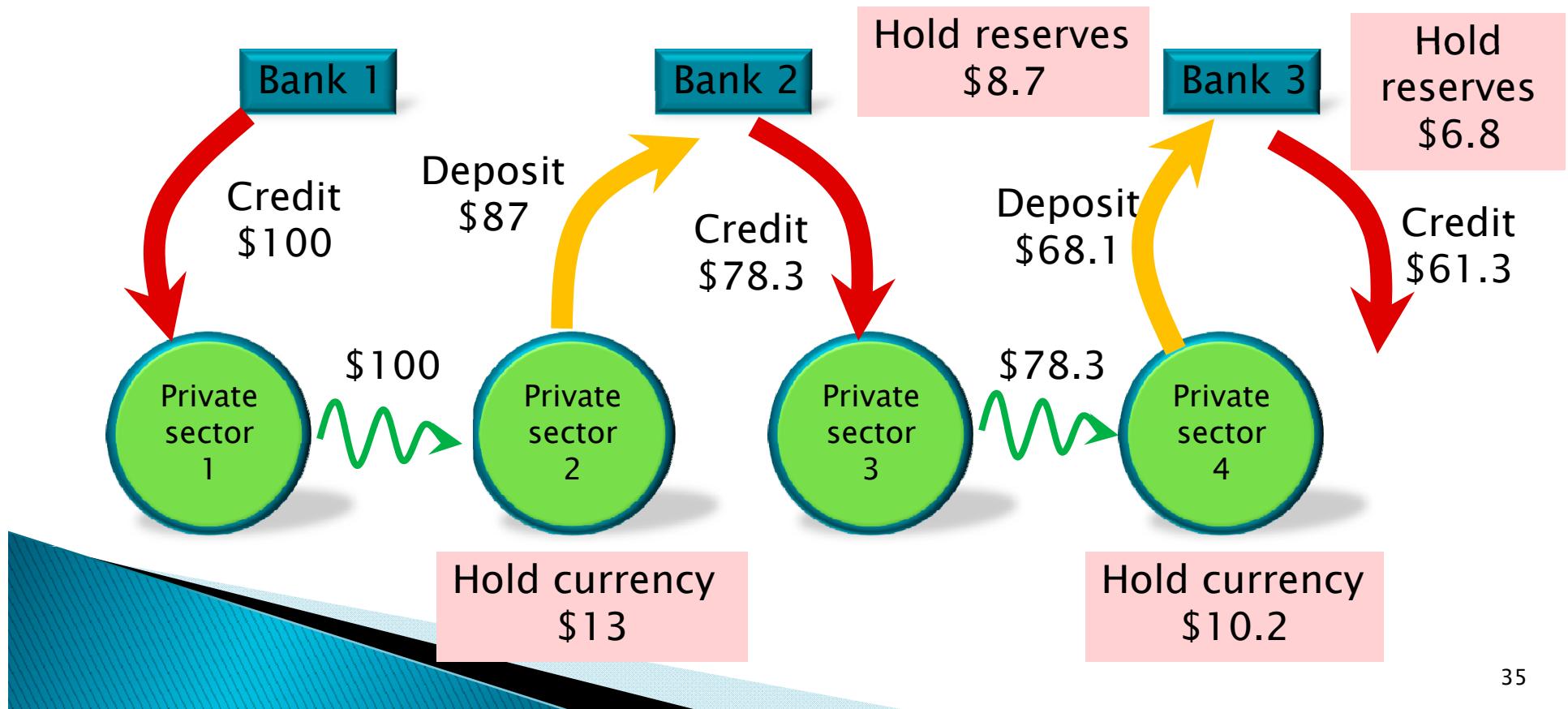
Adding more detail to the Central Bank Balance Sheet:

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



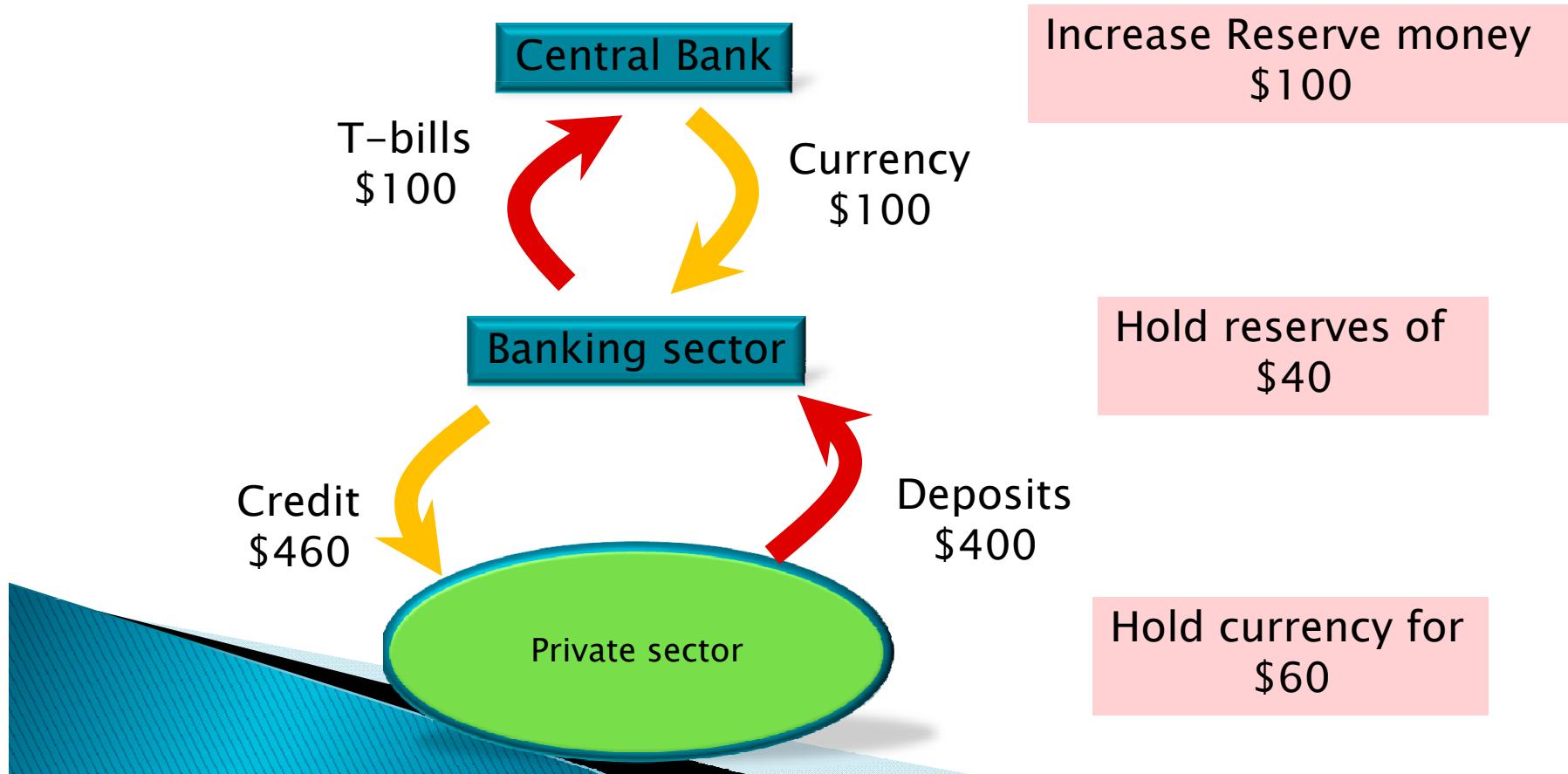
## Limiting Money Creation through Reserve Requirements & Currency Demand

*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!*

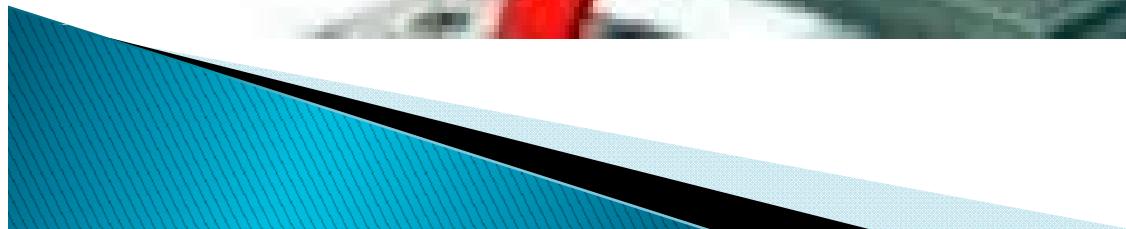




Central Bank of Myanmar - TAOLAM  
“Introduction to Financial Programming”  
December 16-20, 2013 Yangon, Myanmar



## 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)

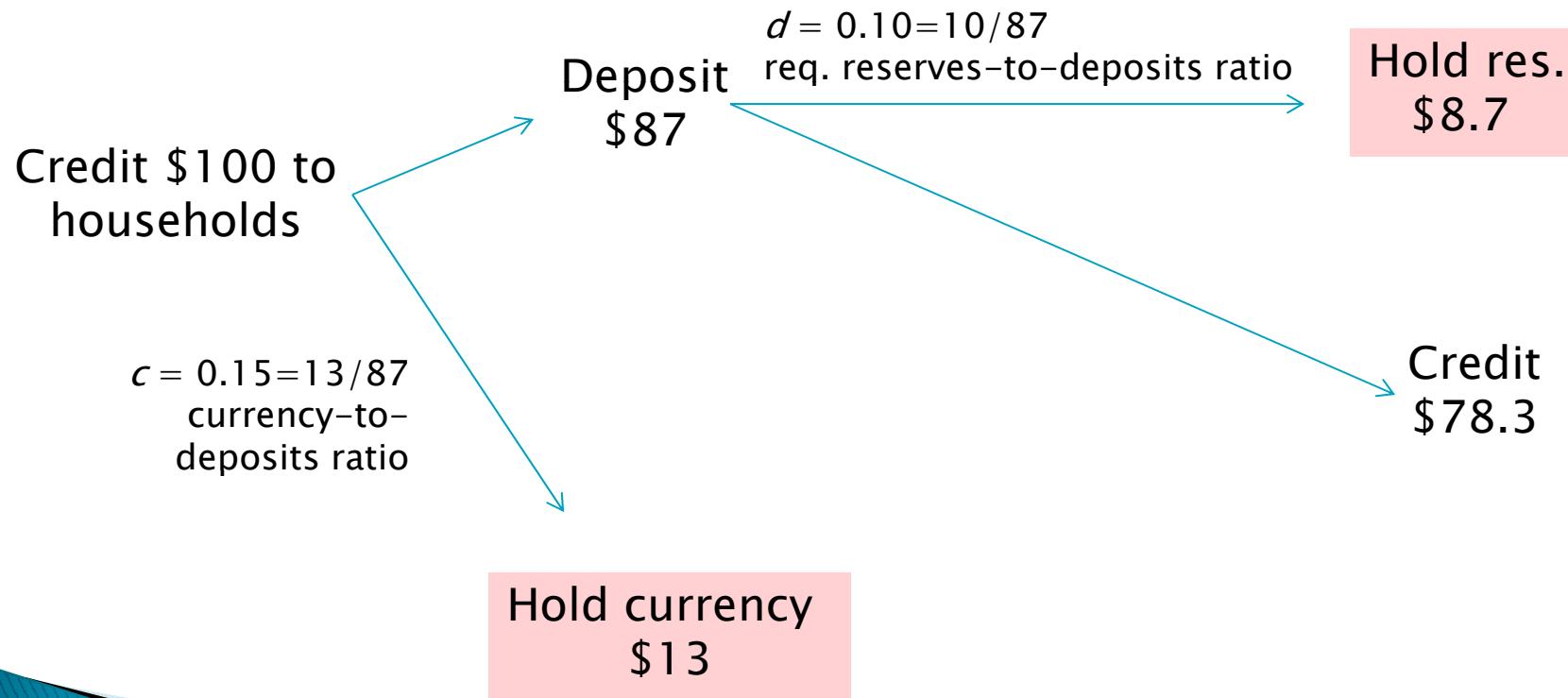
Fundamental determinants of the money multiplier:

- 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



Central Bank of Myanmar - TAOLAM  
“Introduction to Financial Programming”  
December 16-20, 2013 Yangon, Myanmar



# Thank You!

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

