





Banks: Principal Uses of Funds

- Assets
 - Loans: most risky and biggest component, 62% of TA (US, 1998 data)
 - commercial and industrial (C&I) loans: 29% of loans
 - real estate loans: 40%
 - consumer loans: 16%
 - other (e.g. interbank) loans: 15%
 - Investments, 23%: loans + investments = earning assets (or bank credit): 85%

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- short-term, liquid securities
- long-term securities: ST + LT securities = 63% of investments
- other, 37%
- Cash: 9% => earnings assets + cash = financial assets: 94%
- Other assets: 6%
 - buildings
 - equipment

Banks: Principal Sources of Funds

- Liabilities: 92% of TL
 - Deposits, 68%
 - · transactions deposits, 20% of deposits: e.g. checking and money market accounts
 - nontransactions deposits, 80% of deposits, 54% of TL: e.g. time (CDs) or savings deposits
 - Nondeposit sources of funds, 32%: e.g. money market funds or bankers' acceptances
- (Bank) Capital: 8% => capital adequacy, capital/assets, BIS
 - common and preferred stock (number of shares outstanding x par value)
 banks: equity relatively small compared to debt sources of funds
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 banks: highly leveraged (high debt/equity) compared to nonfinancial firms
 - surplus = paid-in capital in excess of par value at the initial sale of stock
 - undivided profits = retained earnings = cumulative net profits before dividends
 - long-term debt: subordinated (second in priority to deposits) notes and debentures
 - reserves for loan (and lease) losses: provisions for loan losses in income statement
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B/S of "State Bank" (\$ Thousands), T.3.1: *Assets*

ASSETS	DEC. 31, 2004	DEC. 31, 2003	
Cash assets	\$ 9,039	\$ 10,522	
Interest bearing bank balances	0	1,000	
Federal funds sold	10,500	1,500	
U.S. Treasury and agency securities	54,082	44,848	
Municipal securities	32,789	34,616	
All other securities	0	0	
Net loans and leases	90,101	81,857	
Real estate loans	50,393	38.975	
Commercial loans	9,615	11,381	
Individual loans	8,824	10,640	
Agricultural loans	20,680	19,654	
Other loans and leases - domestic	3,684	4,025	
Gross loans and leases	93,196	84,675	
Less: Unearned income reserves	89	282	
Reserve for loan and lease losses	3,006	2,356	
Premises, fixed assets, and capitalized leases	2,229	2,398	
Other real estate	2,282	3,012	
Other assets	4,951	4,014	
Total assets	\$205,973	\$183,767	

B/S of "State Bank" (\$ Thousands), T.3.1 (cont.): *Liabilities & Capital*

LIABILITIES & CAPITAL	DEC. 31, 2004	DEC. 31, 2003	
Demand deposits	\$ 23,063	\$ 22,528	
All NOW and ATS accounts	6,021	5,322	
MMDA accounts	41,402	49,797	
Other savings deposits	3,097	2,992	
Time deposits < \$ 100K	31,707	28,954	
Time deposits > \$ 100K	83,009	57,665	
Fotal deposits	188,299	167,258	
Fed funds purchase and resale	0	0	
Other borrowings	0	0	
Bankers' acceptance and other liabilities	3,546	3,101	
Total liabilities	191,845	170,359	
Subordinated notes and debentures	0	0	
All common and preferred equity	14,128	13,408	
Fotal liabilities & capital	\$205,973	\$183,767	
Fotal liabilities & capital	\$205,973	\$183,7	

I/S of "State Bank" (\$ Thousands), T.3.2: Interest Income and Interest Expenses

REVENUES & EXPENSES	DEC. 31, 2004	DEC. 31, 2003
Interest and fees on loans	\$ 8,931	\$ 9,192
Income from lease financing	0	0
Fully taxable	8,880	49,797
Tax exempt	51	50
Estimated tax benefit	38	21
Income on loans and leases	8,969	9,213
US Treasury and agency securities income	3,735	3,025
Municipal securities (tax exempt) income	3,097	3,571
Estimated tax benefit	1,882	2,103
Other securities income	13	0
Investment interest income	8,727	8,699
Interest Fed funds sold	192	83
Interest due from banks	27	
Total interest income	17,915	18,001
Interest on CDs over \$100K	3,248	2,924
Interest on other deposits	6,757	7,167
Subordinated notes and debentures	16	59
All common and preferred equity	0	50
Interest on mortgages and leases	0	0
Interest on subordinated notes and debentures	0	0
Total interest expense	10,021	10,200

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I/S of "State Bank" (\$ Thousands), T.3.2 (cont.): *Net Interest* Income, *Non-Interest* and Net Income

REVENUES & EXPENSES	DEC. 31, 2004	DEC. 31, 2003
Net interest income	\$ 7,894	\$ 7,801
Noninterest income	571	577
Adjusted operating income	8,465	8,378
Overhead expense	3,624	3,876
Provision for loan (and lease) losses	1,294	3,208
Pretax operating income	3,547	1,294
Securities gains (losses)	1,240	3,331
Pretax net operating income	4,787	4,625
Applicable income <i>tax</i>	2,267	2,113
Net operating income	2,520	2,492
Net extraordinary items	0	0
Net income (profit)	2,520	2,492



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Risk Ratios I: Capitalisation

- Leverage ratio
 - = total equity / total assets

may affect the growth of the bank

- Total capital ratio
 = (total equity + long-term debt + reserve for loan losses) / total assets
- book and market values differ and thus yield different results

Risk Ratios II: *Asset Quality*

- Provision for loan loss ratio
 - = provision for loan losses (PLL) / total loans and leases
- Loan ratio
 - = net loans / total assets
- Loss ratio

= net charge-offs on loans (gross charge-offs minus recoveries) / total loans and leases

• Reserve ratio

= reserve for loan losses (reserve for loan losses last year minus gross charge-offs plus PLL and recoveries) / total loans and leases

• Nonperforming ratio

= nonperforming assets (nonaccrual loans and restructured loans) / total loans and leases

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Risk Ratios III: Efficiency and Liquidity

- Operating efficiency: cost control = wages / total expenses
- Liquidity

Temporary investments ratio

= (Fed funds sold + short-term securities + cash + trading account securities) / total assets

a higher ratio indicates more liquidity

Volatile liability dependency ratio

= (total volatile liabilities - temporary investments) / net loans and leases

gives an indication of the extent to which "hot" money is being used to fund the riskiest assets of the bank

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Asset/Liability Management: History

- · Traditionally, banks have concentrated on asset management
 - under Regulation Q, fixed deposit costs on mainly "core" deposits, i.e. not interest-sensitive
 - before October 1979, Fed monetary policy kept interest rates stable
- As loan demand increased in the 1960s, during bouts of inflation associated with the Vietnam War, banks started to use *liability management*
 - under *liability management*, banks *purchase funds from the financial markets* when needed
 - unlike core deposits purchased funds are highly interest-elastic
 - purchased funds have availability risk: these funds can dry up quickly if the market perceives problems of bank safety (e.g., Continental Illinois in 1984)
- Alternatives to managing interest rate risk
 - on-balance sheet adjustments in fixed vs variable pricing and maturities
 - off-balance sheet use of derivatives, such as interest rate swaps, financial futures, and loan guarantees

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Short Run: Dollar Gap Analysis

- Gap\$ = RSA\$ RSL\$ dollars of rate sensitive assets minus dollars of rate sensitive liabilities (normally, less than one-year maturity)
- to compare two or more banks, or track a bank over time, use relative gap ratio = Gap\$ / Total Assets or
 - interest rate sensitivity ratio = RSA\$ / \$RSL\$.
- positive dollar gap (RSA\$ > RSL\$)
 => if interest rates rise (fall), bank NIM or profit will rise (fall)
- negative dollar gap (RSA\$ < RSL\$)
 => if interest rates rise (fall), bank NIM or profit will fall (rise)
- zero dollar gap (RSA\$ = RSL\$)
 => bank profits will be protected from changes in interest rates

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Long Run: Duration Gap Analysis

- While GAP\$ can adjust NIM for changes in interest rates, it does not consider effects of such changes on asset, liability, and equity values
 - => Duration gap analysis:
 - In general, $\Delta V = -D \times V \times [\Delta i/(1+i)]$
 - For assets: $\Delta A = -D \times A \times [\Delta i/(1+i)]$
 - For liabilities: $\Delta L = -D \times L \times [\Delta i/(1+i)]$
 - Change in equity (or net worth) value is: $\Delta E = \Delta A \Delta L$
 - DGAP (duration gap) = $D_A W \times D_I$,

where D_A is the average duration of assets, D_L is the average duration of liabilities, and W is the ratio of total liabilities to total assets.

- DGAP can be positive, negative, or zero
- The change in net worth (or equity) value (ΔE) here is different from the market value of a bank's stock (which is based on future expectations of dividends). This new value is based on changes in the market values of assets and liabilities on the bank's balance sheet.



Esti	mati	ing L	iqui	dity I	Veed	ds: So	urces and Uses	
•	Gener – amo – rela Source • calc • fror	al define ount of lie tive to ab es and culate fut n past ex	nition of quidity n bility to n Uses o ure chang perience	of liqui eeded neet antic f Fund ges over t and expe	dity: sipated lid s Meth time in lo ectations a	quidity dema od: ans and depo about future 1	nds osits needs	
		Estim- ated	Estim- ated	Change	Change	Estimated Liquidity	-	
	Month	Loans	Deposits	Loans	Deposits	Needs	-	
	Dec	1000	1200					
	Jan	1200	1000	200	(200)	400		
	Feb	1600	1200	400	200	200		
	March	1500	1600	(100)	400	(500)	-	
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Estimating Liquidity Needs: Structure of Deposits					
	Amount Held (in millions)	Probability of Withdrawal in Next 3 Months	Expected Withdrawals		
Short-term (unstable):					
Demand deposits	\$ 2	.90	\$ 1.8		
Other transactions account	ts \$10	.60	\$ 6.0		
Medium-term: Small time and savings deposits	\$50	.30	\$15.0		
Long-term (stable): Large time deposits	\$10	.20	<u>\$ 2.0</u> \$24 8		
	3		φ27.0		
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Liquidity Management

- Asset liquidity adjustment
 - Liquid assets are an alternative source of funds
 - A reserve to protect the bank from financial market loss of confidence *Primary* (= required) reserves: vault cash and deposits at the Fed district bank
 - Secondary reserves: money market instruments held by the bank T-bills
 - Federal agency securities
 - repurchase agreements
 - federal funds
 - negotiable certificates of deposit (CDs): high denomination (>\$100,000) bankers' acceptances: drafts used in international trade "accepted" by banks commercial paper: promissory notes issued by major US corporations
- Liability liquidity adjustment: purchase the funds needed
 - Correspondent balances of smaller banks with larger banks
 - Risks

Concluding Wrap-Up

- What have we learnt?
 - How commercial banks function
 - What the principal risk management ratios are
 - How banks effect asset/liability management
 - What bank liquidity management means
- Where we go next: to electronic banking and offbalance sheet activities as forms of financial innovation

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