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What Is Operational Risk?

Financial institutions are in the business of risk management and reallocation, and they have developed sophisticated risk management systems to carry out these tasks. The basic components of a risk management system are identifying and defining the risks the firm is exposed to, assessing their magnitude, mitigating them using a variety of procedures, and setting aside capital for potential losses. Over the past twenty years or so, financial institutions have been using economic modeling in earnest to assist them in these tasks. For example, the development of empirical models of financial volatility led to increased modeling of market risk, which is the risk arising from the fluctuations of financial asset prices. In the area of credit risk, models have recently been developed for large-scale credit risk management purposes.

Yet, not all of the risks faced by financial institutions can be so easily categorized and modeled. For example, the risks of electrical failures or employee fraud do not lend themselves as readily to modeling. Such risks are typically categorized under the rubric of "operational risk." In this *Economic Letter*, we review the current status of operational risk management by financial institutions, particularly commercial banks, and the corresponding regulatory capital requirements proposed by the Basel Committee on Banking Supervision (BCBS).

Defining operational risk

Although the definitions of market risk and credit risk are relatively clear, the definition of operational risk has evolved rapidly over the past few years. At first, it was commonly defined as every type of unquantifiable risk faced by a bank. However, further analysis has refined the definition considerably. As reported by BCBS (September 2001), operational risk can be defined as the risk of monetary losses resulting from inadequate or failed internal processes, people, and systems or from external events.

Losses from external events, such as a natural disaster that damages a firm's physical assets or electrical or telecommunications failures that disrupt business, are relatively easier to define than losses from internal problems, such as employee fraud and product flaws. Because the risks from internal problems will be closely tied to a bank's specific products and business lines, they should be more firm-specific than the risks due to external events.

Measuring operational risk

A key component of risk management is measuring the size and scope of the firm's risk exposures. As yet, however, there is no clearly established, single way to measure operational risk on a firm-wide basis. Instead, several approaches have been developed. An example is the "matrix" approach in which losses are categorized according to the type of event and the business line in which the event occurred. In this way, a bank can hope to identify which events have the most impact across the entire firm and which business practices are most susceptible to operational risk.

Once potential loss events and actual losses are defined, a bank can hope to analyze and perhaps even model their occurrence. Doing so requires constructing databases for monitoring such losses and creating risk indicators that summarize these data. Examples of such indicators are the number of failed transactions over a period of time and the frequency of staff turnover within a division.

Potential losses can be categorized broadly as arising from "high frequency, low impact" (HFLI) events, such as minor accounting errors or bank teller mistakes, and "low frequency, high impact" (LFHI) events, such as terrorist attacks or major fraud. Data on losses arising from HFLI events are generally available from a bank's internal auditing systems. Hence, modeling and budgeting these expected future losses due to operational risk potentially could be done very accurately. However, LFHI events are uncommon and thus limit a single bank from having sufficient data for modeling purposes. For such events, a bank may need to supplement its data with that from other firms. Several private-sector initiatives along these lines already have been formed, such as the Global Operational Loss Database managed by the British Bankers' Association.

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Although quantitative analysis of operational risk is an important input to bank risk management systems, these risks cannot be reduced to pure statistical analysis. Hence, qualitative assessments, such as scenario analysis, will be an integral part of measuring a bank's operational risks.

Mitigating operational risk

In broad terms, risk management is the process of mitigating the risks faced by a bank, either by hedging financial transactions, purchasing insurance, or even avoiding specific transactions. With respect to operational risk, several steps can be taken to mitigate such losses. For example, damages due to natural disaster can be insured against. Losses arising from business disruptions due to electrical or telecommunications failures can be mitigated by establishing redundant backup facilities. Losses due to internal reasons, such as employee fraud or product flaws, are harder to identify and insure against, but they can be mitigated with strong internal auditing procedures.

Since operational risk management will depend on many firm-specific factors, many managerial methods also are possible and will probably be put in place over time. However, some general principles, such as good management information systems and contingency planning, are necessary for effective operational risk management. BCBS (December 2001) laid out a framework for managing operational risk at internationally active banks; this framework also could be more broadly applied to other types of financial institutions.

The framework consists of two general categories. The first includes general corporate principles for developing and maintaining a bank's operational risk management environment. For example, a bank's governing board of directors should recognize operational risk as a distinct area of concern and establish internal processes for periodically reviewing operational risk strategy. To foster an effective risk management environment, the strategy should be integral to a bank's regular activities and should involve all levels of bank personnel.

The second category consists of general procedures for actual operational risk management. For example, banks should implement monitoring systems for operational risk exposures and losses for major business lines. Policies and procedures for controlling or mitigating operational risk should be in place and enforced through regular internal auditing.

Capital budgeting for operational risk

Banks hold capital to absorb possible losses from their risk exposures, and the process of capital budgeting for these exposures, including operational risk, is a key component of bank risk management.

In parallel with industry developments, BCBS proposed in 2001 that an explicit capital charge for operational risk be incorporated into the new Basel Capital Accord. At first this capital charge would apply to internationally active banks. The Committee initially proposed that the operational risk charge capital requirement, but after a period of review, the Committee lowered the percentage to 12%. The final version of the Basel Accord is tentatively scheduled for a year-end 2002 release.

To encourage banks to improve their operational risk management systems, the new Basel Accord also will set criteria for implementing more advanced approaches to operational risk. Such approaches are based on banks' internal calculations of the probabilities of operational risk events occurring and the average losses from those events. The use of these approaches will generally result in a reduction of the operational risk capital requirement, as is currently done for market risk capital requirements and is proposed for credit risk capital requirements. These criteria and the new capital regulations will require bank supervisors to conduct evaluations of operational risk management systems on a regular basis. As noted by BCBS, these supervisory evaluations would be complemented greatly by public disclosure sufficient to allow independent assessments by market participants.

Conclusion

Operational risk is intrinsic to financial institutions and thus should be an important component of their firm-wide risk management systems. However, operational risk is harder to quantify and model than market and credit risks. Over the past few years, improvements in management information systems and computing technology have opened the way for improved operational risk measurement and management. Over the coming few years, financial institutions and their regulators will continue to develop their approaches for operational risk management and capital budgeting.

Jose A. Lopez
Economist

References

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Basel Committee on Banking Supervision. 2001. "Sound Practices for the Management and Supervision of Operational Risk" (December). http://www.bis.org/publ/bcbs86.htm (accessed January 2002).

BANKS HEADQUARTERED BY REGION
SEPTEMBER 30, 2001
(NOT SEASONALLY ADJUSTED, PRELIMINARY DATA)
(BANKS WITH ASSETS LESS THAN OR EQUAL TO $1 BILLION ARE DEFINED AS SMALL)

		UNITED STATES			TWELFTH DISTRICT		
		ALL	SMALL	LARGE	ALL	SMALL	LARGE
ASSETS AND LIABILITIES — $ MILLION							
ASSETS	TOTAL	6,499,722	1,027,140	5,472,582	637,305	93,619	543,686
	FOREIGN	768,634	1,126	767,508	5,100	18	5,083
	DOMESTIC	5,731,088	1,026,014	4,705,074	632,204	93,601	538,603
LOANS	TOTAL	3,829,904	662,556	3,167,348	401,824	63,058	338,765
	FOREIGN	286,471	1,021	285,449	3,665	46	3,619
	DOMESTIC	3,543,433	661,534	2,881,899	398,159	63,012	335,147
	REAL ESTATE	1,702,535	423,892	1,278,643	199,687	40,396	159,291
	COMMERCIAL RE	490,307	153,567	336,740	73,844	21,225	52,619
	SINGLE FAMILY RES	924,847	182,786	742,061	86,020	8,289	77,731
	COMMERCIAL	846,929	116,656	730,273	93,253	13,509	79,744
	CONSUMER	555,942	77,525	478,418	77,935	6,672	71,263
	CREDIT CARDS	242,706	9,434	233,272	56,037	1,796	54,241
	AGRICULTURAL	47,155	30,810	16,345	6,087	1,633	4,454
	OTHER LOANS	390,871	12,652	378,220	21,198	803	20,396
INV. SECURITIES	TOTAL	1,087,441	229,847	857,594	119,392	15,664	103,728
	U.S. TREASURIES	46,787	12,158	34,629	3,476	824	2,652
	U.S. AGENCIES, TOTAL	663,040	153,216	509,824	48,592	10,019	38,573
	U.S. AGENCIES, MBS	486,051	69,611	416,440	36,219	5,212	31,007
	OTHER MBS	64,714	3,725	60,988	9,960	466	9,494
	OTHER SECURITIES	312,900	60,746	252,153	57,365	4,355	53,010
LIABILITIES	TOTAL	5,909,901	922,665	4,987,236	570,264	83,514	486,750
	DOMESTIC	5,141,266	921,539	4,219,728	565,164	83,496	481,667
DEPOSITS	TOTAL	4,261,885	844,065	3,417,820	432,116	75,704	356,413
	FOREIGN	680,653	1,716	678,937	14,420	45	14,374
	DOMESTIC	3,581,232	842,349	2,738,883	417,697	75,658	342,038
	DEMAND	494,377	114,818	379,559	54,533	11,868	42,665
	MMDA & SAVINGS	1,611,048	233,074	1,377,974	235,903	26,788	209,115
	SMALL TIME	761,583	269,589	491,994	56,540	16,293	40,247
	LARGE TIME	564,208	138,578	425,631	62,026	15,877	46,149
	OTHER DEPOSITS	150,016	86,290	63,726	8,694	4,831	3,862
OTHER BORROWINGS		482,849	22,635	460,214	38,108	1,452	36,656
EQUITY CAPITAL		581,684	104,445	477,239	66,891	10,102	56,789
LOAN LOSS RESERVE		67,763	9,376	58,387	9,156	1,218	7,938
LOAN COMMITMENTS		4,758,520	603,856	4,154,664	757,803	294,468	463,334
TIER1 CAPITAL RATIO		0.097	0.136	0.090	0.108	0.128	0.105
TOTAL CAPITAL RATIO		0.125	0.147	0.121	0.137	0.141	0.136
LEVERAGE RATIO		0.078	0.096	0.075	0.089	0.101	0.087
LOAN LOSS RESERVE RATIO		1.769	1.415	1.843	2.279	1.931	2.343
QUARTERLY EARNINGS AND RETURNS — $ MILLION							
INCOME	TOTAL	140,398	21,921	118,478	16,569	2,446	14,123
	INTEREST	100,327	18,232	82,095	11,586	1,850	9,736
	FEES & CHARGES	6,752	1,079	5,673	647	78	569
EXPENSES	TOTAL	112,283	17,640	94,642	12,163	1,902	10,262
	INTEREST	45,680	8,093	37,586	4,277	662	3,615
	SALARIES	23,290	4,285	19,006	2,332	482	1,851
	LOAN LOSS PROVISION	11,848	929	10,919	1,555	172	1,383
	OTHER	31,464	4,334	27,131	3,999	585	3,413
TAXES		8,985	1,210	7,774	1,595	222	1,373
NET INCOME		17,290	2,959	14,330	2,581	311	2,271
ROA (% ANNUALIZED)		1.099	1.172	1.085	1.645	1.350	1.695
ROE (% ANNUALIZED)		11.890	11.334	12.011	15.436	12.305	15.993
NET INTEREST MARGIN (% ANNUALIZED)		3.472	4.014	3.369	4.656	5.157	4.570
ASSET QUALITY —PERCENT OF LOANS							
NET CHARGEOFFS (% ANNUALIZED)							
	TOTAL	0.999	0.382	1.128	1.283	0.649	1.401
	REAL ESTATE	0.305	0.065	0.383	0.091	0.053	0.101
	COMMERCIAL	1.433	0.766	1.521	1.595	0.882	1.713
	CONSUMER	2.697	1.418	2.887	4.267	3.865	4.304
	CREDIT CARDS	4.632	5.048	4.615	5.229	8.889	5.108
	AGRICULTURAL	1.139	0.611	2.089	0.167	0.378	0.089
PAST DUE & NON-ACCRUAL							
	TOTAL	2.687	2.349	2.757	2.630	2.426	2.668
	REAL ESTATE	2.042	2.008	2.053	1.820	1.714	1.846
	CONSTRUCTION	2.334	2.291	2.349	2.773	2.547	2.857
	COMMERCIAL	1.842	1.843	1.842	1.427	1.376	1.448
	FARM	2.528	2.112	3.471	4.715	4.377	4.920
	HOME EQUITY LINES	1.293	1.152	1.312	1.198	0.777	1.265
	MORTGAGES	2.371	2.224	2.411	1.962	2.121	1.946
	MULTI-FAMILY	1.129	1.065	1.146	1.093	0.585	1.268
	COMMERCIAL	3.269	3.081	3.294	3.467	3.041	3.538
	CONSUMER	3.769	3.424	3.820	3.650	5.627	3.466
	CREDIT CARDS	4.422	7.089	4.314	4.116	11.617	3.868
	AGRICULTURAL	2.464	1.437	4.306	4.517	1.943	5.460
NUMBER OF BANKS		8,129	7,737	392	582	507	75
NUMBER OF EMPLOYEES		1,656,021	386,055	1,269,966	156,974	36,526	120,448

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TYPE OF LOAN		AUG 1999	NOV 1999	FEB 2000	MAY 2000	AUG 2000	NOV 2000	FEB 2001	MAY 2001	AUG 2001	NOV 2001
COMMERCIAL and INDUSTRIAL LOANS											
TOTAL	U.S.	6.78	7.03	7.44	7.78	8.28	8.15	7.19	6.22	5.61	3.89
	DISTRICT	6.69	6.98	7.04	7.42	7.90	7.85	7.04	5.94	5.22	3.58
BY RISK RATING:											
MINIMAL RISK	U.S.	6.05	6.01	6.47	6.82	7.42	7.54	6.23	6.01	4.50	2.97
	DISTRICT	7.19	6.36	6.49	6.19	7.25	6.66	6.54	4.98	4.46	2.88
LOW RISK	U.S.	5.90	6.52	6.87	7.15	7.55	7.57	6.54	5.44	4.81	3.08
	DISTRICT	6.20	6.74	6.79	6.99	7.65	7.68	6.53	5.42	4.66	3.14
MODERATE RISK	U.S.	6.93	7.22	7.54	7.97	8.41	8.33	7.28	6.38	5.57	4.25
	DISTRICT	7.15	7.15	7.15	7.57	8.06	8.04	7.51	6.35	5.54	3.84
OTHER	U.S.	7.55	7.71	8.24	8.63	8.95	8.85	7.97	6.82	6.16	4.31
	DISTRICT	6.66	6.93	7.23	7.57	8.00	7.79	7.70	6.64	6.35	4.39
BY MATURITY/REPRICING INTERVAL:											
DAILY	U.S.	6.15	6.43	6.84	7.21	7.74	7.84	6.88	5.94	5.15	3.67
	DISTRICT	6.65	7.08	6.87	7.59	7.94	7.85	7.22	6.03	5.33	3.91
2 TO 30 DAYS	U.S.	6.62	6.80	7.42	7.60	8.18	7.60	6.94	5.80	5.84	3.66
	DISTRICT	6.56	6.86	7.00	7.37	7.83	7.78	6.96	5.87	5.16	3.47
31 TO 365 DAYS	U.S.	6.88	7.58	7.67	8.04	8.13	8.04	7.22	5.90	5.42	3.94
	DISTRICT	6.97	6.85	6.96	7.05	7.70	7.68	6.39	5.47	4.72	3.23
OVER 365 DAYS	U.S.	7.73	8.02	8.81	8.37	8.84	8.37	8.48	7.61	7.02	6.09
	DISTRICT	8.43	8.28	7.90	4.64	8.72	9.03	7.36	7.70	7.30	5.08
CONSUMER, AUTOMOBILE	U.S.	8.44	8.66	8.88	9.21	9.62	9.63	9.17	8.67	8.31	7.86
	DISTRICT	8.98	9.07	9.28	9.23	9.87	9.87	9.94	9.34	8.34	8.54
CONSUMER, PERSONAL	U.S.	13.38	13.52	13.76	13.88	13.85	14.12	13.71	13.28	13.25	12.62
	DISTRICT	13.62	14.45	14.41	14.89	13.25	13.25	13.67	12.48	13.22	12.45
CONSUMER, CREDIT CARD	U.S.	15.08	15.13	15.47	15.39	15.98	15.99	15.66	15.07	14.60	14.22
	DISTRICT	15.73	15.63	15.60	15.76	16.16	16.25	16.94	15.54	15.28	15.01

SOURCES: SURVEY OF TERMS OF BUSINESS LENDING AND TERMS OF CONSUMER CREDIT