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**Fair Value Accounting in the  
Banking Industry**

**Occasional Paper Series**

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# **FAIR VALUE ACCOUNTING IN THE BANKING INDUSTRY**

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## **Overview**

This paper studies the application of fair value accounting in bank holding companies in the United States with the purpose of evaluating the effects of expanding fair value accounting in the banking industry.

The paper documents the current application of fair value accounting in the industry, showing what proportions of recognized assets and liabilities of bank holding companies are at or close to fair value on the balance sheet, have related unrealized gains and losses in income, or have fair values disclosed in the footnotes. In each case, it evaluates the advantages and disadvantages of the current treatment and makes an assessment of the magnitudes of economic assets and liabilities that currently are omitted from the balance sheet. Turning to the issue of the likely impact of expanded application of fair values, the paper asks how large are the actual and potential differences between fair values and book values of various assets and liabilities and how credit, interest rate and prepayment risks are likely to determine those differences. It considers the availability of market-based information for measuring fair value and evaluates the correlations between fair values of economic assets and liabilities due to natural hedges, asset-liability management, and changes in asset values affecting the risk and value of liabilities. It also addresses the issue of how a switch to fair value accounting would mitigate or, alternatively, facilitate earnings management activities.

The primary conclusion of the analysis is that expanding fair value accounting is not likely to significantly improve the information in bank financial statements and, in some cases, may introduce distortions that reduce accounting quality. The analysis is pertinent to bank analysts and investors for it not only documents the impact of fair value accounting on banks but also informs about the drivers of value and risk on which accounting should report.

## I. Introduction

This paper studies the application of fair value accounting in the U.S. banking industry. Its primary objective is to inform on the applicability of fair value accounting in the banking industry and the desirability of adopting standards which will expand fair value reporting. To achieve this goal, this research presents relevant evidence that addresses the following issues and questions:

- (a) *The current application of fair value accounting*
  - 1) What proportions of recognized assets and liabilities of bank holding companies (BHCs) are reported at or close to fair value on the balance sheet, have related unrealized gains and losses recognized in income, or have fair values disclosed in footnotes?
  - 2) What are the magnitudes of economic assets and liabilities which are omitted from the balance sheet?
- (b) *The likely impact of implementing fair value accounting on various assets, liabilities, and off-balance sheet items*
  - 3) For each item, how large are the actual and potential differences between fair and book values?
  - 4) How important are credit, interest rate, and prepayment risks? (This analysis is important because high risk implies high likelihood of significant differences between fair and book values; in addition, the precision of pricing varies across exposures.)
  - 5) What is the availability and quality of market-based information for measuring fair value?
  - 6) What are the fair value correlations with other economic assets and liabilities, and what are the sources of these correlations (e.g., natural hedge, asset-liability management, impact of changes in assets value on the risk and value of liabilities)?
- (c) *The accounting treatment of various assets, liabilities, and off-balance sheet items*
  - 7) What is the current accounting treatment and what are its advantages and disadvantages?
  - 8) How can banks “manage” the balance sheet and income statement?
  - 9) How would a switch to fair value accounting mitigate or alternatively facilitate earnings management activities?
  - 10) How can GAAP be improved?

While the primary objective of this research is to study the impact of fair value accounting on BHCs, the analyses also inform on drivers of value and risk in the banking industry and discuss related accounting issues. Therefore, the paper should also be of interest to bank analysts, investors, and other users of financial information.

The empirical analysis utilizes data from essentially all regulatory consolidated financial statements (FR Y-9C reports) submitted by BHCs to the Federal Reserve System for the quarters Q1:2001 through Q3:2005. These reports contain uniform and detailed calendar year-to-date income

statements, end-of-quarter balance sheets, and supplementary information. Under the Bank Holding Company Act, BHCs with total consolidated assets of \$150 million or more, or that satisfy certain other conditions (e.g., have public debt), are required to file FR Y-9C reports on a quarterly basis. Thus, the sample covers essentially all of the banking industry during the five years 2001 through 2005. This period is characterized by significant volatility in interest rates and economic activity, making the results reasonably representative.<sup>1</sup> The empirical evidence is corroborated with insights obtained by examining a sample of 10-Ks.

During the sample period, more than 90% of reported BHCs' assets and essentially all of their liabilities consisted of financial instruments. These statistics, however, should be interpreted cautiously. For many BHCs, major economic assets are either omitted from the balance sheet or reported at nominal amounts. Such assets include intangibles related to traditional banking activities, such as core deposit and lending relationships. They also include human capital and technology intangibles, which allow banks to generate fees and other sources of non-interest income from activities such as investment banking, asset management and securitizations. While BHCs do not provide fair value information for these assets, their magnitudes are likely to be substantial. For example, during the sample period, total non-interest income across all banks was of similar magnitude to net interest income. In addition, for many BHCs, the contribution of core deposits to net interest income (that is, the reduction in interest expense due to the use of deposit liabilities instead of capital market debt to fund assets) is the largest source of income. Thus, while almost all *reported* assets and liabilities are financial instruments, large portions of *economic* assets and liabilities are not. This observation has important implications for the application of fair value accounting for BHCs. Advocates of fair value accounting often argue that essentially all of the assets and liabilities of banks are financial instruments, which are generally easier to mark-to-market compared with other assets and liabilities. The present analysis indicates that this is not the case.

The existence of significant intangibles has the following additional implications. First, intangible assets are particularly difficult to value, even when compared with other non-financial assets. In general, valuing intangibles requires making predictions about future operations, including demand and cost data, while many tangible assets can be valued using appraisals or exit values. Thus, allowing banks to recognize the estimated fair values of internally-developed intangibles may lead to significant errors and biases in financial reports. Second, the fair values of bank intangibles are often

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<sup>1</sup> Under some conditions, fair value accounting may be more or less informative than suggested by our results. For example, large unexpected changes in interest rates or credit spreads may lead to increased usefulness of fair value information.



correlated with those of recognized financial instruments, implying that marking-to-market the financial instruments without fair valuing the intangibles may distort book value and earnings. For example, the core deposit intangible typically increases in value when interest rates rise, offsetting the decline in the value of fixed rate loans. As another example, the volume of securitizations, and hence securitization gains, typically increase when interest rates decline, offsetting the decline in the value of servicing rights.

Another issue with fair valuing intangible assets is related to the definition of fair value. The above discussion assumes a “value in use” definition—the fair value of an asset is equal to the present value of net cash flows associated with using the asset. An alternative definition, which has been adopted by the FASB and IASB, is market or exit value. Since most intangibles are not actively traded, firms would have to estimate exit values in order to fair value intangibles. This introduces additional managerial discretion in estimating fair value (what portion of the value in use cannot be realized in sale due to asymmetric information or unique synergies?).

On average, 36% of banks’ reported assets (cash and balances due, federal funds sold, securities purchased under resell agreements, available-for-sale securities, and trading assets) and 16% of their liabilities (federal funds purchased, securities sold under repurchase agreements, and trading liabilities) were reported on the balance sheet at or close to fair value. Another 52% of assets (loans, held-to-maturity securities, and other financial assets) and 34% of liabilities (time deposits and debt) were subject to Statement of Financial Accounting Standard (SFAS) 107 and SFAS 115 fair value disclosure requirements.<sup>2</sup> Thus, for approximately 88% of BHCs’ reported assets and 50% of their liabilities, fair value estimates were generally available during the sample period.

While significant portions of assets and liabilities are reported on the balance sheet at fair value, the resulting unrealized gains and losses are reported primarily in other comprehensive income. The most significant exceptions are trading instruments which, for very large BHCs, constitute significant portions of assets and liabilities. However, for most small and mid-sized banks, reported income reflects little, if any, unrealized gains and losses.

Most financial assets and liabilities are currently accounted for by using the effective interest rate method. Under this method, book value is equal to the present value of promised cash flows, discounted using the historical at-issue yield. Consequently, unrealized gains/losses are due to changes in the instruments’ yield, which in turn are due to instrument-specific factors (e.g., changes in the

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<sup>2</sup> Some financial instruments (e.g., leases) are excluded from the scope of SFAS 107. In addition, SFAS 107 specifies that the disclosed fair value of deposits with no stated maturity should be the amount payable on demand, which typically overstates the economic liability.

issuer's credit risk) or to market exposures (e.g., changes in interest rates or in the market pricing of credit risk). When the term structure of interest rate is not flat, yield changes also result from the passage of time. For example, when the at-issue term structure has a positive slope (as is typically the case), market yields on existing financial instruments decrease as their times-to-maturity shorten, resulting in unrealized gains. There are two possible fixes to the distortion caused by such predictable unrecognized gains and losses. One is to use fair value accounting. The other is to continue to use historical cost accounting, but to measure periodic interest with at-issue forward rates instead of their average (i.e., the at-issue yield).

BHCs classify investments in securities as either available-for-sale (95% of securities, 16% of assets) or held-to-maturity (5% of securities, 1% of assets). Available-for-sale securities are reported on the balance sheet at fair value, but the resulting unrealized gains/losses are excluded from income and reported as part of other comprehensive income. Held-to-maturity securities are accounted for by using the effective interest rate method, but their fair values are disclosed in a supplementary schedule. To inform on the economic impact of switching to full fair value accounting for securities, statistics from the distribution of unrealized securities gains/losses were examined. During the sample period, unrealized gains and losses were small for most BHCs. Thus, implementing full fair value accounting for securities during the sample period would have had a relatively small effect.

All derivatives are reported on the balance sheet at fair value (2% of assets, 2% of liabilities). Unrealized gains and losses on derivatives, other than those used for hedging cash flows or investments in foreign operations, are reported in income. Almost all derivatives are classified as trading (96% of notional value, 97% of fair value), implying that essentially all unrealized derivative gains and losses are reported in income. Similar to securities and other financial instruments, the risk associated with derivatives depends on their notional amounts. However, unlike other financial instruments where book value is close to the notional amount, the book value of derivatives—which is equal to their fair value—is significantly smaller than their notional amount. Thus, while derivatives account for only 2% of assets and 2% of liabilities, their contribution to risk is substantially larger. This is especially true, given that banks appear to use derivatives for trading rather than hedging. The fact that hedge accounting is hardly used by banks implies that bank balance sheets reflect little, if any, marking-to-market of hedged assets and liabilities.

To evaluate whether BHCs generate value from investments in interest-bearing cash balances (2% of assets), federal funds sold (1% of assets), and securities purchased with resell agreements (5% of assets), the distribution of excess yields on these instruments was examined. Large BHCs

consistently generate significant excess returns, suggesting the existence of economic intangibles related to these investments. In contrast, for small and mid-size BHCs, these investments appear to be value-neutral activities.

Fair value estimates are available in FR Y-9C reports only for selected assets and liabilities, and analysis of excess yields is meaningful only in the context of short-term instruments with trivial risk. Therefore, to evaluate the potential magnitude of unrealized gains/losses on other assets and liabilities, the risks associated with the related activities were analyzed (low risk implies that the likelihood of significant differences between the fair and book values is relatively small).

The types and magnitudes of exposures vary considerably across assets and liabilities. While most banks' financial instruments are subject to interest rate risk, the primary exposure for many loans is credit risk. In contrast, the primary exposure for mortgage-backed securities is prepayment risk, and credit risk is either trivial or of secondary importance (most mortgage-backed securities, which constitute the majority of investment securities, are either issued, guaranteed or insured by U.S. government entities). Most banks' derivatives are over-the-counter interest-rate contracts which, unlike exchange-traded derivatives (where the exchange serves as the counterparty), are subject to credit risk. In addition, some large BHCs have significant exposures to credit derivatives. Still, the primary exposure for most derivatives is interest rate risk. Deposits contribute to bank value by providing a relatively cheap source of funds, compared with capital market funds. Thus, the economic risks associated with deposits include the risk of early withdrawals and the potential for a narrowing of the margin between the costs of market funds and deposits. Since most time deposits are either short-term or variable rate (about 84% of time deposits), and carry significant early withdrawal penalties, the risk of withdrawal prior to maturity is relatively small. Still, banks typically expect substantial renewals of matured time deposits, and so face the risk of excessive withdrawals at maturity. For deposits with no stated maturity (more than 70% of total deposits), the key risk is that actual growth will fall below expectations (or the rate of decline will be larger than expected).

The analysis of the relative magnitudes, composition, and characteristics of the different assets and liabilities is important not only because it indicates the potential for unrealized gains/losses, but also because the precision of pricing varies across exposures. Whereas the pricing of interest rate risk is relatively simple and non-discretionary, that of credit and prepayment risks involves substantial discretion and complications. Thus, this analysis informs two aspects of fair value accounting: (1) the potential effects on the financial statements of marking-to-market assets and liabilities, assuming that

fair values are measured precisely; and (2) the potential effects of measurement error and bias in fair value estimates.

Overall, the empirical analyses conducted in this study suggest that for most BHCs, the difference between the market and book values of equity is due primarily to expected earnings from future activities, with the difference between the fair and book values of existing assets and liabilities being of a secondary importance. This is especially true for BHCs with strong customer relationships or significant investments in technology or human capital. Thus, even if one takes a balance sheet perspective for financial reporting (as opposed to an income statement approach, which emphasizes the concept of “permanent income”), implementing fair value accounting with respect to existing assets and liabilities has a limited potential for improving accounting quality. Also, given the estimation errors and potential biases involved in measuring the values of intangible assets, it is not likely that fair valuing intangibles will improve accounting quality.

The paper proceeds as follows. Section II examines the composition of BHCs’ balance sheets and income statements, and the profitability of various activities. Section III analyzes the different asset categories and related income items, while Section IV examines liabilities and related costs. Section V discusses derivatives and off-balance sheet items. Section VI concludes the discussion with recommendations and implications.

## II. Banks' Financial Statements and Profitability

### A. Sample

The sample includes essentially all regulatory consolidated financial statements (FR Y-9C reports) that BHCs submitted to the Federal Reserve System for the 19 quarters Q1:2001-Q3:2005.<sup>3</sup> The number of observations per quarter ranges from 1,572 to 2,332, and generally increases over time. The total number of observations is 38,323 (2,691 different BHCs). The BHCs range in size (total assets) from \$38 million to \$1,547,789 million. The median size is \$341 million, the lower quartile is \$221 million, and the upper quartile is \$713 million.

We conduct all analyses for five samples: (1) firm-quarter observations with total assets less than \$1 billion (small BHCs); (2) firm-quarter observations with total assets between \$1 billion and \$10 billion (mid-sized BHCs); (3) firm-quarter observations with total assets between \$10 billion and \$100 billion (large BHCs); (4) firm-quarter observations with total assets greater than \$100 billion (very large BHCs); and (5) all BHCs. We partition the sample based on bank size because substantial research demonstrates (and our analysis confirms) that size is a good proxy for differences in business mix and strategy. We recognize, of course, that size is not the only relevant partitioning variable.

Table II(A)(1) presents statistics for the size distribution of each sample. As shown, “very large BHCs” constitute only 1% of the observations, but account for almost 70% of total assets of the banking industry. In contrast, “small BHCs” constitute more than 80% of the observations, but account for less than 5% of total assets.

To better present the economic significance of assets, liabilities and other financial statement items, we focus in the empirical analysis below on financial ratios calculated using aggregate data for each sample. That is, each ratio is calculated by dividing the total of the numerator across all sample firm-quarter observations by the total for the denominator. The resulting ratios are in effect weighted averages of the individual bank-quarter ratios, with weights proportional to size (as measured by the denominator of each ratio).

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<sup>3</sup> FR Y-9C reports are available at [http://chicagofed.org/economic\\_research\\_and\\_data/bhc\\_data.cfm](http://chicagofed.org/economic_research_and_data/bhc_data.cfm). These data become available about two to three months after the end of each quarter (e.g., data for the third quarter of 2004 became available at the beginning of December 2004).

In constructing the sample, we removed a few observations with likely recording errors (the sum of individual asset categories or liability categories was different from the reported totals). We also deleted several observations of BHCs that had new business combinations accounted for using the pooling-of-interest method during the quarter. (This filter, which is not relevant after 2001, is required because we calculate quarterly income statement data using changes in year-to-date amounts.)

The sample period begins in 2001 primarily because many of the variables used were added to the report in the first quarter of 2001.

<b>Table II(A)(1): Size Distribution<sup>a</sup></b>					
	All BHCs	Very Large BHCs	Large BHCs	Mid-sized BHCs	Small BHCs
Total assets (in \$millions)					
Mean	6,137	394,153	33,476	2,843	352
Lower quartile	221	138,456	14,148	1,298	207
Median	341	263,948	26,671	1,971	283
Upper quartile	713	619,921	45,498	3,613	440
Number of firm-quarter observations	38,323	415	1,348	5,467	31,093
Percentage of sample	100.00%	1.08%	3.52%	14.27%	81.13%
Percentage of the banking industry's total assets	100.00%	69.55%	19.19%	6.61%	4.66%
<sup>a</sup> The sample includes essentially all regulatory consolidated financial statements (FR Y-9C reports) that BHCs submitted to the Federal Reserve System for the 19 quarters Q1:2001-Q3:2005					

## B. Common-Size Balance Sheets

Table II(B)(1) presents common-size balance sheets for each of the size-based samples, calculated by dividing the total of each line item across all firm-quarter observations in the related sample by total assets. As shown, loans constitute the largest asset category, with ratios ranging from 48.63% to 65.55% across the four sub-samples. The second largest asset category consists of available-for-sale and held-to-maturity securities (“securities”), with ratios ranging from 15.11% to 26.69%.

Very large BHCs have the smallest proportions of loans and securities, but have large investments in trading assets (11.48% compared to 2.25% / 0.18% / 0.02% for large / mid-sized / small BHCs, respectively). They also have significant investments in federal funds sold and securities purchased under resell agreements (8.37% compared to 3.34% / 1.92% / 2.55% for large / mid-sized / small BHCs). Still, financial instruments constitute less than 90% of total assets for large BHCs, compared to 91.05% / 94.57% / 96.06% for large / mid-sized / small BHCs.<sup>4</sup>

Focusing on non-financial assets, we observe that investments in fixed assets are very small, ranging from 0.81% to 1.95% of total assets and exhibiting negative correlation with size. In contrast, intangibles and “other assets” are positively related to size, and are quite significant for large and very large BHCs. Intangibles result primarily from business acquisitions, which are less common for small banks. Large banks are also more likely to engage in non-traditional banking activities such as insurance, which result in assets classified on the FR Y-9C balance sheet as “other assets.”

<sup>4</sup> These percentages understate the true amounts, since “other assets” likely contain some financial instruments.

<b>Table II(B)(1): Common-Size Balance Sheet</b>					
	All BHCs	Very Large BHCs	Large BHCs	Mid-sized BHCs	Small BHCs
<b>Assets:</b>					
Cash and balances due from depository institutions	4.41%	4.27%	5.15%	3.77%	4.17%
Federal funds sold and securities purchased under agreements to resell	6.71%	8.37%	3.34%	1.92%	2.55%
Securities	17.07%	15.11%	19.53%	26.69%	22.49%
Trading assets	8.43%	11.48%	2.25%	0.18%	0.02%
Loans and lease financing receivables	52.26%	48.63%	59.30%	60.63%	65.55%
Other financial assets	1.56%	1.63%	1.47%	1.39%	1.28%
Total financial assets <sup>a</sup>	90.44%	89.50%	91.05%	94.57%	96.06%
Premises and fixed assets	1.00%	0.81%	1.28%	1.57%	1.95%
Intangible assets	3.01%	3.27%	3.10%	1.75%	0.54%
Other assets	5.56%	6.43%	4.58%	2.11%	1.45%
Total assets	100.00%	100.00%	100.00%	100.00%	100.00%
<b>Liabilities and equity:</b>					
Federal funds purchased and securities sold under agreements to repurchase	9.91%	11.11%	8.54%	6.79%	2.06%
Trading liabilities	4.31%	5.97%	0.81%	0.02%	0.00%
Deposits	54.04%	49.15%	58.96%	72.30%	80.72%
Debt	14.82%	15.52%	16.21%	9.12%	6.61%
Other liabilities	7.88%	9.67%	5.15%	1.79%	1.09%
Minority interest	0.57%	0.54%	0.75%	0.57%	0.44%
Perpetual preferred stock	0.07%	0.06%	0.14%	0.10%	0.04%
Common equity	8.39%	7.97%	9.46%	9.31%	9.03%
Total liabilities and equity	100.00%	100.00%	100.00%	100.00%	100.00%

<sup>a</sup>These percentages understate the true amounts, since "other assets" likely contain some financial instruments.

While the differences in asset composition across the size-based samples are substantial, those in liability composition are even larger. In particular, deposits range from 49.15% to 80.72% of funds across the four sub-samples and are negatively related to size. These large differences in deposits reflect a differential focus: small BHCs focus on retail banking, while many large BHCs concentrate on wholesale banking.<sup>5</sup> Large BHCs obtain substantial portions of their funds from capital market sources (debt, federal funds purchased, and securities sold under repurchase agreements) which, due to the competitiveness of capital markets, offer little ability to generate value.

Finally, we observe that the common equity ratios are similar across the size-based samples, except for very large banks which have significantly smaller ratios. For all samples, the common equity ratios are less than 10%, reflecting the high leverage ratios which characterize the banking industry.

<sup>5</sup> This differential focus also explains the differences in fixed assets across the sub-samples, since retail banking involves substantial investments in branches.

### C. Common-Size Income Statements

Table II(C)(1) presents common-size income statement for each of the size-based samples, calculated by dividing the total of each line item across all firm-quarter observations in the related sample by total revenues. Bank revenue is conventionally defined as the total of net interest income and non-interest income. For small and mid-sized BHCs, revenues are generated primarily by earning a spread over the interest cost of liabilities (net interest income is 76.42% / 64.46% of total revenues for small / mid-sized BHCs, respectively). In contrast, large and very large BHCs generate about half of their revenues from fees and other sources of non-interest income. For each of the size-based samples, the largest source of revenue is interest and fee income on loans and leases. This is especially true for small and mid-sized companies, which invest primarily in loans and generate relatively small amounts of non-interest income.

While interest and fee income on loans and leases decreases with bank size, the provision for loan and lease losses increases with bank size. These two opposing trends appear to suggest that large banks are less successful than small banks in their lending activities. However, this interpretation is incorrect because it ignores the size of the loans portfolio. On average, large banks invest in relatively high credit risk loans that offer high yields. But since they invest relatively small portions of their assets in loans, large banks earn smaller amounts of interest income compared to small banks. That is, the size effect dominates the rate effect when explaining differences across banks in the magnitude of interest income. In contrast, the credit risk effect dominates the size effect when explaining differences in credit losses. Consequently, the magnitude of credit losses increases with bank size. Still, as discussed in Section III(E) below, large banks generate a higher net return on loans compared to small banks.<sup>6</sup>

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<sup>6</sup> To see how these seemingly contradicting facts can be reconciled, consider two banks: SMALL and LARGE. Per each dollar of assets, SMALL invests \$0.8 in loans with an average yield of 10% and credit losses of 2%, and LARGE invests \$0.4 in loans with average yield of 15% and annual credit losses of 6%. SMALL has higher interest income per dollar of assets (\$0.08 compared to \$0.06) and lower credit losses (\$0.016 compared to \$0.024). However, the loans of LARGE generate a higher net yield (9% compared to 8%).



**Table II(C)(1): Common-Size Income Statement**

	All BHCs	Very Large BHCs	Large BHCs	Mid- sized BHCs	Small BHCs
Interest and fee income on loans and leases	62.59%	59.78%	61.82%	76.20%	95.05%
Interest income on balances due from depository institutions	0.96%	1.03%	1.00%	0.32%	0.41%
Interest and dividend income on securities	13.47%	12.41%	13.59%	21.54%	19.12%
Interest income from trading assets	4.65%	6.41%	1.03%	0.17%	0.01%
Interest income on federal funds sold and securities purchased under agreements to resell	3.69%	4.85%	1.20%	0.71%	1.10%
Other interest income	0.54%	0.43%	0.83%	0.63%	0.62%
Total interest income	85.89%	84.92%	79.47%	99.57%	116.3%
Interest on deposits	15.53%	13.81%	15.38%	24.45%	32.80%
Interest on federal funds purchased and securities sold under repurchase agreement	5.43%	6.61%	3.09%	3.03%	0.84%
Interest on debt and trading liabilities	10.26%	11.12%	9.31%	6.85%	5.51%
All other interest expense	0.49%	0.37%	0.74%	0.78%	0.74%
Total interest expense	31.71%	31.91%	28.52%	35.11%	39.89%
Net interest income	54.19%	53.01%	50.96%	64.46%	76.42%
Provision for loan and lease losses	8.69%	9.09%	8.90%	5.06%	6.17%
Net interest income after provision for credit losses	45.50%	43.92%	42.06%	59.40%	70.25%
Income from fiduciary activities	4.22%	3.50%	6.90%	4.85%	1.52%
Service charges on deposit accounts in domestic offices	6.03%	5.62%	6.43%	7.60%	8.71%
Trading revenue	2.75%	3.56%	1.27%	0.36%	0.04%
Investment banking, advisory, brokerage, and underwriting	6.93%	7.12%	7.16%	7.80%	0.90%
Venture capital revenue	0.25%	0.40%	-0.09%	-0.01%	-0.01%
Net servicing fees	3.39%	4.14%	2.23%	0.66%	0.52%
Net securitization income	3.56%	3.06%	6.86%	0.18%	0.06%
Insurance commissions and fees	5.66%	7.46%	1.83%	1.37%	0.89%
Net gains (losses) on sales of loans and leases	1.41%	0.97%	2.20%	2.91%	2.64%
Net gains (losses) on sales of other real estate owned	-0.04%	-0.05%	-0.02%	0.05%	0.03%
Net gains (losses) on sales of other assets (excluding securities)	0.61%	0.78%	0.24%	0.20%	0.19%
Other non-interest income	11.04%	10.43%	14.04%	9.57%	8.10%
Total non-interest income	45.81%	46.99%	49.05%	35.54%	23.58%
Realized gains and losses on available-for-sale and held-to-maturity securities	0.93%	0.99%	0.78%	0.99%	0.64%
Salaries and employee benefits	27.64%	26.53%	28.74%	31.43%	35.40%
Expenses of premises and fixed assets	7.35%	7.10%	7.51%	8.60%	9.05%
Amortization and impairment of intangibles	1.41%	1.38%	1.82%	1.06%	0.47%
Other non-interest expense	24.79%	26.19%	21.93%	21.60%	20.28%
Total non-interest expense	61.19%	61.20%	60.00%	62.69%	65.19%
Income before income taxes	31.05%	30.70%	31.88%	33.24%	29.28%
Income taxes	9.89%	9.83%	10.52%	10.00%	7.32%
Minority interest	0.46%	0.49%	0.45%	0.29%	0.26%
Income before extraordinary items	20.70%	20.38%	20.91%	22.95%	21.70%
Extraordinary items	0.18%	0.31%	-0.18%	0.07%	-0.01%
Net income	20.88%	20.69%	20.73%	23.02%	21.69%
Preferred dividends	0.07%	0.05%	0.10%	0.13%	0.04%
Net income available to common	20.81%	20.64%	20.63%	22.90%	21.65%

The primary source of non-interest income for small BHCs is service charges on deposits. This revenue item is also significant for each of the other size-based samples. With the exception of small banks, another primary source of non-interest income is “investment banking, advisory, brokerage and underwriting.” Very large banks also generate significant revenue from trading, servicing fees, and insurance activities. Large BHCs derive large portions of their revenues from fiduciary activities and securitizations.

Consistent with the existence of economies of scale in the banking industry, non-interest expense generally decreases with bank size. This is particularly true for salaries and employee benefits, the largest non-interest expense. “Other non-interest expense,” in contrast, is substantially greater for the very large BHCs. This item includes expenditures on data processing and other technology-related expenses, which are used to generate non-interest income. Under GAAP, such expenditures are typically expensed as incurred, although they often generate future benefits. This is a key point that will be addressed in subsequent sections: since banks are required to immediately expense all expenditures that generate intangibles, their balance sheets do not reflect major economic assets which are used to generate non-interest income. The hefty magnitude of non-interest income for large and very large BHCs suggests that unless all intangibles are recorded at fair value, the book value of equity is likely to understate its fair value substantially. As discussed below, measuring the fair value of intangibles requires significant discretion, which is likely to induce error and bias in the estimates.

#### **D. Profitability**

The statistics in Table II(C)(1) show that, on an income margin basis, small and mid-sized BHCs are more profitable than large and very large BHCs. These differences in margins, however, do not translate into differences in profitability. As shown in Table II(D)(1), large and very large banks have larger turnover ratios, reflecting their higher proportions of non-interest income which involves relatively small investments in recognized assets.<sup>7</sup> The very large BHCs also have higher leverage ratios, which further contribute to average shareholders’ profitability. Consequently, the relationship between profitability and size is positive rather than negative.

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<sup>7</sup> The turnover ratios in Table II(D)(1) are very low for three reasons: (1) the numerator reflects quarterly, not annual revenue; (2) revenue is measured as the sum of net interest income and non-interest income, and, therefore, it reflects only a portion of interest income (net interest income is equal to interest income minus interest expense); and (3) unlike non-financial services firms, where revenue reflects the cost of the goods or services sold in addition to the mark-up (gross profit), banks revenue measures only the mark-up—the difference between the amount repaid by the customer and the amount borrowed.

	All BHCs	Very Large BHCs	Large BHCs	Mid-sized BHCs	Small BHCs
Margin (= Net income available to common / revenue)	20.81%	20.64%	20.63%	22.90%	21.65%
Turnover (= Revenue / average total assets)	1.51%	1.50%	1.65%	1.37%	1.27%
Leverage (= Average total assets / average common equity)	11.99	12.62	10.67	10.84	11.05
ROE (= Net income available to common / average common equity, or product of the above three terms)	3.77%	3.91%	3.64%	3.40%	3.04%
Annualized ROE	15.94%	16.57%	15.36%	14.32%	12.72%

<sup>a</sup>Averages are calculated using beginning and end of quarter values.

Table II(D)(2) analyzes the contribution of earning assets and liabilities to net interest income. The average yield on earning assets is substantially larger than the cost of interest-bearing liabilities, generating an average spread of 3.38%. Since interest-bearing liabilities are smaller than earning assets, the net interest margin (i.e., net interest income divided by average earning assets) is larger than the spread. That is, BHCs are able to lever up the return on earning assets by funding a portion of these assets using equity and non-interest-bearing liabilities. (Note, however, that measures of return on assets, which are calculated after deducting the cost of liabilities, are difficult to interpret.)

	All BHCs	Very Large BHCs	Large BHCs	Mid-sized BHCs	Small BHCs
<b><i>Earning assets:</i></b>					
Federal funds sold and securities purchased under agreements to resell	2.89%	2.99%	2.21%	1.89%	1.91%
Securities	5.05%	5.24%	4.75%	4.73%	4.78%
Loans and lease financing receivables	7.18%	7.34%	6.74%	6.86%	7.36%
Trading assets	3.51%	3.55%	2.88%	5.31%	3.24%
Other earning assets	2.78%	2.72%	3.16%	2.30%	2.32%
Earning assets	5.92%	5.87%	5.89%	6.03%	6.46%
<b><i>Liabilities:</i></b>					
Interest-bearing domestic deposits	1.92%	1.77%	2.01%	2.11%	2.36%
Interest-bearing foreign deposits	2.56%	2.61%	2.03%	2.44%	2.14%
Federal funds purchased and securities sold under agreements to repurchase	2.89%	3.06%	2.16%	2.36%	2.00%
Other interest-bearing liabilities	3.36%	3.21%	3.76%	4.55%	4.33%
Interest-bearing liabilities	2.53%	2.57%	2.43%	2.42%	2.53%
Net interest rate spread	3.38%	3.30%	3.46%	3.60%	3.92%
Interest-bearing liabilities / earnings assets	0.837	0.838	0.836	0.837	0.836
Net interest margin	3.74%	3.67%	3.80%	3.94%	4.27%

<sup>a</sup>Interest rates are reported on a tax-equivalent basis (relevant for loans and securities)

The high average yields on earning assets are due primarily to loans—the average yield on loans is more than two percentage points larger than that of any other asset or liability category. On the liability

side, the average differences in rates are relatively small and all interest-bearing liabilities appear relatively cheap. This is due in part to the short maturity and liquidity of most BHC liabilities as well as to the FDIC insurance of deposits.

While yields on the different asset categories do not exhibit a clear correlation with size, the overall yield on earning assets is negatively related to size. This is due to differences in asset mix. As discussed above, large banks have substantially lower proportions of loans, compared with small banks, and loan yields are greater on average than yields on other earning assets.

Other interest-bearing liabilities consist primarily of debt instruments. These funds are substantially cheaper for large and very large BHCs due to the negative association of bank size with the probability of default and the maturity/repricing intervals of debt instruments (large banks issue primarily short-term or floating rate instruments). Since they issue debt instruments with lower credit and interest rate risks, large banks are able to borrow at lower rates, compared with small banks.

### III. Analysis of Assets

#### A. Cash and Balances Due from Depository Institutions

This item includes: (a) non-interest-bearing balances due from depository institutions, currency and coin, checks in process of collection, and other cash items; and (b) interest-bearing balances due from depository institutions and foreign central banks. As shown in Table III(A)(1), cash and balances constitute about 4.4% of total assets. The economic significance of this asset category becomes even more apparent when it is compared to equity—due to the high leverage ratios of BHCs, cash and balances are on average greater than 50% of the book value of common equity. The relative magnitude of cash and balances varies across the size-based samples, primarily due to differences in interest-bearing balances, which are positively related to bank size (to illustrate this, multiply “percentage of total assets” by composition percentages). This trend is partially offset by a negative correlation between size and “cash and non-interest-bearing balances,” which is due in part to the negative correlation between size and deposits (cash and non-interest-bearing balances include reserves that banks are required to maintain against transaction accounts).

<b>Table III(A)(1): Economic Significance and Composition of Cash and Balances Due from Depository Institutions</b>					
	All BHCs	Very Large BHCs	Large BHCs	Mid-sized BHCs	Small BHCs
<b><i>Economic significance:</i></b>					
Percentage of total assets	4.39%	4.27%	5.09%	3.77%	4.17%
Percentage of common equity	52.29%	53.49%	54.03%	40.74%	46.14%
<b><i>Composition:</i></b>					
Non-interest-bearing balances and currency and coin	61.51%	60.92%	55.43%	78.54%	79.07%
Interest-bearing balances	38.49%	39.08%	44.57%	21.47%	20.93%
	100.00%	100.00%	100.00%	100.00%	100.00%

Banks hold cash and non-interest-bearing balances for various reasons, including reserve requirements, liquidity needs, and to generate fees and provide depositor satisfaction (cash held in ATMs). The periodic cost of holding cash and non-interest-bearing balances is equal to the interest income that could have been earned had this money been invested in interest-bearing instruments with trivial risk.<sup>8</sup> This quantity is estimated as the product of the daily average annualized yield on constant maturity 90-day Treasury Bills and the average of the beginning and end of quarter balances of cash and non-interest-bearing balances. Table III(A)(2) reports the average forgone yield during the period Q1:2001-

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<sup>8</sup> The benchmark return is that of instruments with trivial risk because cash and balances are essentially risk free.

Q3:2005, calculated as the total of forgone interest income over the firm-quarter observations divided by the total of quarterly average cash and non-interest-bearing balances. Consistent with the low levels of interest rates during the sample period, the periodic cost of holding cash appears relatively small: only about 2% annually (the small differences across the samples are due to differences in the relative quantity of cash and non-interest-bearing balances over time). However, to the extent that these balances are permanently held, the present value of forgone interest in all future years is equal to the cash balance independent of interest rates (low interest rates imply small forgone interest, but also low discount rate, yielding a present value which is unrelated to interest rates).

Since cash and non-interest-bearing balances contribute to bank value by facilitating other activities—primarily deposit-taking, fair value estimates of related intangibles (e.g., core deposit and lending relationships) should reflect the cost of holding cash as well as the costs of other non-earning assets (e.g., fixed assets) which help generate or support the intangibles. This is one reason why intangible fair values are difficult to measure: one has to predict investments in non-earning assets and other auxiliary expenditures, in addition to direct cash flows. As emphasized throughout this document, the inability to reliably value intangibles is a primary argument against fair value accounting.

	All BHCs	Very Large BHCs	Large BHCs	Mid-sized BHCs	Small BHCs
Forgone yield on non-interest-bearing balances	1.98%	1.97%	1.99%	2.01%	1.97%
Annualized yield on interest-bearing balances	3.47%	3.76%	2.96%	2.28%	2.39%
Annualized excess yield on interest-bearing balances	1.48%	1.79%	0.89%	0.27%	0.47%
Proportion of balances earning positive excess yield	84.33%	84.25%	90.30%	57.50%	57.56%
Annualized positive excess yield	1.87%	2.25%	1.05%	0.97%	1.29%
Proportion of balances earning negative excess yield	15.67%	15.75%	9.70%	42.50%	42.44%
Annualized negative excess yield	-0.61%	-0.61%	-0.58%	-0.66%	-0.63%

To evaluate whether banks generate value by investing in interest-bearing cash balances, the annualized yield on these balances was calculated along with its deviation from the benchmark Treasury yield (“excess yield”). To the extent that investments in interest-bearing balances involve higher credit and/or interest rate risk than 90-day Treasury Bills, that risk should be reflected in negative excess returns in some firm-quarter observations. In contrast, a consistently positive and significant excess return may indicate that BHCs generate value by investing in interest-bearing cash balances. Accordingly, the excess yield was decomposed using the following formula:

$$\text{Excess yield} = (\text{Proportion of balances earning positive excess yield} \times \text{Annualized excess yield on balances earning positive excess yield}) + (\text{Proportion of balances earning negative excess yield} \times \text{Annualized excess yield on balances earning negative excess yield})$$

Next examined was the proportion of balances earning negative excess yield (a proxy for the probability of a loss) and the annualized excess yield conditioned on the excess yield being negative (a proxy for the magnitude of loss, given that there is a loss). These quantities are similar to the “probability of default” and “loss given default” concepts, which are commonly used in credit risk analysis.

For small and mid-sized BHCs, the distribution of the excess yield in Table III(A)(2) is centered slightly above zero and has little dispersion. This suggests that for small and mid-sized banks, investments in interest-bearing balances are value-neutral—they do not add value, but they also do not impose a cost of forgone interest. In contrast, for large and especially very large BHCs, the excess return is quite significant and the down-side is limited (both probability and magnitude of loss). Thus, it appears that large BHCs generate some value in these activities.

## **B. Federal Funds Sold and Securities Purchased under Agreements to Resell**

Federal funds sold are immediately available funds lent to other financial institutions under agreements or contracts that have an original maturity of one business day or roll over under a continuing contract. These transactions may be secured or unsecured or may involve an agreement to resell loans or other instruments that are not securities.

Securities purchased under agreements to resell are funds lent under agreements to resell securities or participations in pools of securities. That is, the BHC “purchases” from the borrower securities which are effectively used as collateral for the loan. At maturity, the BHC “sells” back identical or substantially identical securities for an amount specified or determined in the agreement. These transactions typically have maturities ranging from overnight to up to a year. Securities purchased under agreements to resell are reported on the balance sheet at the amount the securities will be ultimately repurchased, including accrued interest.

Table III(B)(1) presents statistics describing the economic significance and composition of federal funds sold and securities purchased under resell agreements. The relative magnitude of these investments is positively related to size and is particularly large for very large BHCs. Interestingly, small BHCs invest almost exclusively in federal funds sold while very large BHCs invest primarily in securities purchased under agreements to resell.

<b>Table III(B)(1): Economic Significance and Composition of Federal Funds Sold and Securities Purchased under Agreements to Resell</b>					
	All BHCs	Very Large BHCs	Large BHCs	Mid-sized BHCs	Small BHCs
<b><i>Economic significance:</i></b>					
Percentage of total assets	6.73%	8.39%	3.36%	1.93%	2.54%
Percentage of common equity	80.40%	105.35%	35.80%	20.82%	28.16%
<b><i>Composition:<sup>a</sup></i></b>					
Federal funds sold in domestic offices	9.79%	4.03%	36.13%	84.49%	98.07%
Securities purchased under agreements to resell	90.21%	95.97%	63.87%	15.52%	1.94%
	100.00%	100.00%	100.00%	100.00%	100.00%

<sup>a</sup> The composition data are for the period Q1:02-Q3:05

Both federal funds sold and securities purchased under agreements to resell have trivial credit risk. Due to their short maturity, federal funds sold have no interest or prepayment risk. Accordingly, we expect the yield on federal funds sold to be close to the risk free rate. Securities purchased under agreement to resell may have some interest rate and prepayment risk, although these exposures are likely to be small. Table III(B)(2) presents an analysis of the excess yield on federal funds sold and securities purchased under resell agreements. Consistent with the higher risk associated with securities repurchase agreements (compared to federal funds sold), the excess yield increases with bank size reflecting the higher proportion of repurchase agreements held by large BHCs. However, the decomposition of the excess yield suggests that the higher excess yield earned by large BHCs is not associated with additional risk, as the downside risk is very small for all banks. Similar to interest-bearing cash balances, therefore, it appears that large BHCs generate value in these activities.

<b>Table III(B)(2): Profitability of Federal Funds Sold and Securities Purchased under Agreements to Resell</b>					
	All BHCs	Very Large BHCs	Large BHCs	Mid-sized BHCs	Small BHCs
Annualized yield on federal funds sold and securities purchased under agreements to resell	2.95%	3.03%	2.51%	2.15%	2.07%
Annualized excess yield on federal funds sold and securities purchased under agreements to resell	0.87%	0.93%	0.56%	0.15%	0.08%
Proportion earning positive excess yield	78.75%	79.17%	81.94%	66.04%	53.52%
Annualized positive excess yield	1.19%	1.27%	0.72%	0.31%	0.28%
Proportion earning negative excess yield	21.26%	20.83%	18.06%	33.96%	46.48%
Annualized negative excess yield	-0.31%	-0.34%	-0.19%	-0.15%	-0.15%



## C. Securities

### C.1. Accounting Treatment and Classification

On the asset side, BHCs report securities holdings under several classifications: held-to-maturity securities, available-for-sale securities, trading assets, investments in unconsolidated subsidiaries and associated companies, and equity securities that do not have readily determinable fair values.<sup>9</sup> Yet the sub-category “securities” on the balance sheet typically refers only to available-for-sale and held-to-maturity securities, with the other classifications reported separately or combined with other items. Accordingly, this section focuses on available-for-sale and held-to-maturity securities.

Under SFAS 115, investments in debt securities are classified as held-to-maturity if the firm has “the positive intent and ability” to hold the securities until they mature. Other debt securities, as well as equity securities that have readily determinable fair values and were not issued by subsidiaries or associated companies, are classified as either available-for-sale or trading securities. Trading securities are “bought and held principally for the purpose of selling them in the near term.” Available-for-sale is a residual classification, that is, securities other than those classified as either held-to-maturity or trading.

Held-to-maturity securities are carried on the balance sheet at historical cost, adjusted for the cumulative amortization of any at-purchase discount or premium. The periodic amortization is equal to the difference between interest income and interest receipts, where interest income is calculated as the product of the at-purchase yield and the securities’ book value at the beginning of the period. It is straightforward to show that this method (commonly referred to as the effective interest rate method) results in a book value which is equal to the present value of the remaining contractual payments, discounted using the historical at-purchase yield.<sup>10</sup> The securities’ fair value, in contrast, is equal to the present value of the remaining contractual payments discounted at the current market yield. Thus,

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<sup>9</sup> As discussed in the previous section, “securities purchased under agreements to resale” are in effect collateralized lending rather than securities holding.

<sup>10</sup> Let  $B_0$  denote the book value of the investment immediately after its purchase. Note that  $B_0$  is equal to the purchase price, which in turn is equal to the present value of all promised coupons and principal payments using the at-purchase yield (this is by definition). That is,  $B_0 = C \times \rho^{-1} + C \times \rho^{-2} + \dots + C \times \rho^{-n+1} + (F + C) \times \rho^{-n}$  where  $C$  is the coupon,  $\rho$  is one plus the at-purchase yield,  $F$  is the principal amount, and  $n$  is the number of interest periods. Under the effective rate method,  $B_1$ —book value at the end of the first interest period—is calculated as follows:  $B_1 = B_0 \times \rho - C$ . Thus,  $B_1 = (C \times \rho^{-1} + C \times \rho^{-2} + \dots + C \times \rho^{-n+1} + (F + C) \times \rho^{-n}) \times \rho - C = C \times \rho^{-1} + C \times \rho^{-2} + \dots + C \times \rho^{-n+2} + (F + C) \times \rho^{-n+1}$ . That is,  $B_1$  is equal to the present value of all remaining cash flows, discounted using the at-purchase yield. Similar substitutions can be used to prove this statement for  $B_2$  through  $B_n$ .

differences between the fair and book values of held-to-maturity securities are due to changes in their yields. In particular, yield increases result in unrealized losses, while yield decreases give rise to gains.

Holding times to maturity of all contractual payments constant, yield changes result from changes in interest rates, prepayment expectations, credit risk or the pricing of credit risk. However, even when these factors remain unchanged, the market yield of a given bond may still change as time passes. To see why, note that a bond yield is essentially a weighted average of the yields of the different contractual payments. These yields are determined primarily by the term-structure of interest rates. When the term structure has a positive slope, the yields of the different cash flows increase with maturity. Thus, as time passes, the yields of the different cash flows (and, therefore, the security's overall yield) decrease as the period of maturity shortens. When the term structure is inverted, the opposite occurs. Because the term structure is typically upward-sloping (due to the liquidity premium), security yields usually decrease over time, giving rise to unrealized gains. This feature of the effective rate method is also relevant for other financial assets and liabilities, including loans, time deposits, and debt.

Available-for-sale securities are reported on the balance sheet at fair value, with unrealized gains and losses excluded from earnings and reported (net of deferred taxes) in a separate component of shareholders' equity. Interest income on debt securities classified as available-for-sale is calculated identically to that of held-to-maturity securities (the at-purchase yield times the amortized cost at the beginning of the period). Dividend income from equity securities classified as available-for-sale is recognized when dividends are declared.

Realized gains and losses on held-to-maturity and available-for-sale securities are reported in the income statement and calculated as the difference between the selling price and the amortized cost at the time of sale. In addition, other-than-temporary impairments are treated as realized losses and recognized in income. Firms have substantial discretion in measuring other-than-temporary impairment. In general, a sustained decline in market price below book value indicates a potential impairment. When deciding whether to recognize impairment, BHCs consider the length of time and the extent to which market value has been less than cost, the investment horizon (a longer horizon suggests a higher likelihood of price recovery before the sale), the cause of the price decline, and other factors relevant for the determination of whether the price decline is "other-than-temporary."

Table III(C)(1) presents the distribution of securities between available-for-sale and held-to-maturity. As shown, most investments in securities are classified as available-for-sale. This is especially true for very large BHCs.

<b>Table III(C)(1): Economic Significance and Classification of Securities</b>					
	All BHCs	Very Large BHCs	Large BHCs	Mid-sized BHCs	Small BHCs
<i>Economic significance:</i>					
Percentage of total assets	17.07%	15.11%	19.53%	26.69%	22.50%
Percentage of common equity	203.35%	189.62%	206.38%	287.06%	248.99%
<i>Classification:</i>					
Available-for-sale	94.77%	99.12%	90.02%	83.94%	86.35%
Held-to-maturity	5.23%	0.88%	9.98%	16.06%	13.65%
	100.00%	100.00%	100.00%	100.00%	100.00%

## C.2. Unrealized Gains and Losses

We next examine the magnitude of differences between the fair and book values of securities. Since available-for-sale securities are reported on the balance sheet at fair value, we focus on held-to-maturity securities. Table III(C)(2) provides information about unrealized gains and losses on held-to-maturity securities. Similar to the excess yield analysis in the previous sections, we report the overall net unrealized gains/losses as well as the proportions of balances representing net gains versus those representing net losses and the magnitudes of those conditional gains and losses. Both the unconditional and conditional differences between the fair and book values are relatively small. We therefore conclude that during our sample period the book values of securities were consistently close to their fair values.

<b>Table III(C)(2): Unrealized Gains (Losses) on Held-to-maturity Securities</b>					
	All BHCs	Very Large BHCs	Large BHCs	Mid-sized BHCs	Small BHCs
Net unrealized gains (losses) on held-to-maturity securities as a % of their book value	1.29%	3.22%	0.81%	1.20%	1.45%
Proportion of balances with net gains	71.39%	88.83%	61.05%	76.40%	77.18%
Net gains as a % of book value of net gain positions	2.22%	3.74%	2.00%	1.88%	2.20%
Proportion of balances with net losses	28.61%	11.17%	38.95%	23.60%	22.82%
Net losses as a % of book value of net loss positions	-1.05%	-0.97%	-1.06%	-1.00%	-1.08%

As discussed above, while available-for-sale securities are marked-to-market on the balance sheet, the resulting unrealized gains and losses do not pass through the income statement. Thus, to evaluate the extent to which cumulative pretax income fails to reflect unrealized securities gains and losses, Table III(C)(3) presents an analysis of unrealized gains (losses) on all securities—held-to-maturity and available-for-sale. The distribution of net unrealized gains and losses on all securities is similar to that of held-to-maturity. If all securities were marked-to-market with unrealized gains and losses reported

in income, cumulative income (i.e., retained earnings) would have been larger by approximately 2% of equity ( $= 1.41\% \times (1 - 38\%) \times 2$ , where 1.41% is the net gain expressed as a percentage of the securities cost, 38% is an estimate of the marginal federal and state tax rate, and 2 is the average ratio of securities to equity book value). While this estimate represents the aggregate effect, the decomposition statistics suggest that this effect would have been small for most firms.

	All BHCs	Very Large BHCs	Large BHCs	Mid-sized BHCs	Small BHCs
Net unrealized gains (losses) on securities as a % of cost	1.41%	1.67%	0.90%	1.07%	1.25%
Proportion of balances with net gains	75.95%	78.42%	70.41%	74.43%	73.74%
Net gains as a % of book value of net gain positions	2.13%	2.35%	1.67%	1.72%	2.03%
Proportion of balances with net losses	24.05%	21.58%	29.59%	25.57%	26.26%
Net losses as a % of book value of net loss positions	-0.84%	-0.79%	-0.93%	-0.81%	-0.93%

### **C.3. Composition and Risk**

Table III(C)(4) gives the distribution of securities holdings, as measured by fair value. The primary types of securities held by BHCs are mortgage-backed securities (MBS) and U.S. government agency obligations. BHCs also hold significant investments in securities issued by state and political subdivisions, asset-backed securities (excluding MBS), and U.S. Treasury securities. The composition of the securities portfolio varies considerably across the size-based subsamples. Compared to large BHCs, small BHCs invest substantially more in U.S. government agency obligations and state and municipal bonds, and less in MBS. Very large BHCs hold relatively small investments in agency obligations and have almost 30% of their securities portfolios classified as “other debt securities” in the FR Y-9C report. Examination of several annual reports of members of this group indicates substantial investments in foreign and corporate bonds.

	All BHCs	Very Large BHCs	Large BHCs	Mid-sized BHCs	Small BHCs
U. S. Treasury securities	4.44%	4.60%	4.47%	3.94%	3.58%
U. S. government agency obligations (excluding MBS)	11.44%	4.88%	18.34%	21.52%	35.60%
Securities issued by states and political subdivisions in the U. S.	6.06%	4.55%	4.30%	11.26%	18.77%
Mortgage backed securities (MBS)	51.54%	49.38%	60.75%	55.10%	34.30%
Asset backed securities (excluding MBS)	4.52%	5.55%	4.59%	0.72%	0.40%
Other debt securities	19.90%	28.94%	5.62%	5.13%	5.18%
Mutual funds and equity securities with determinable fair values	2.10%	2.10%	1.94%	2.34%	2.18%
	100.00%	100.00%	100.00%	100.00%	100.00%

<sup>a</sup>Based on fair value

Table III(C)(5) presents statistics for mortgage-backed securities (MBS), the largest category of securities held by BHCs. Approximately 87% of MBSs are issued or guaranteed by government agencies or government sponsored agencies, or are collateralized by such MBS. Thus, most MBSs have trivial credit risk. Moreover, the remaining 13% have limited credit risk as they are backed by mortgages and are often credit-enhanced (e.g., through third party guarantees, cash reserve funds or overcollateralization). Thus, the credit risk exposure of MBS is generally not a major concern. The primary exposures for MBSs are interest rate and prepayment risks.

<b>Table III(C)(5): Mortgage Backed Securities (MBS)</b>					
	All BHCs	Very Large BHCs	Large BHCs	Mid-sized BHCs	Small BHCs
<i>Economic significance:</i>					
Percentage of total securities	51.58%	49.39%	60.80%	55.20%	34.37%
Percentage of total assets	8.80%	7.46%	11.88%	14.73%	7.73%
Percentage of common equity	104.88%	93.66%	125.48%	158.47%	85.57%
<i>Composition:<sup>a</sup></i>					
Pass-through MBS, issued or guaranteed by Government/government-sponsored agencies	66.46%	76.22%	46.53%	60.08%	69.19%
Other pass-through MBS	1.89%	1.60%	3.47%	0.35%	0.20%
Structured MBS, issued or guaranteed by government/government-sponsored agencies or collateralized by such MBS <sup>11</sup>	20.30%	11.87%	33.05%	32.71%	27.56%
All other	11.35%	10.31%	16.96%	6.86%	3.05%
	100.00%	100.00%	100.00%	100.00%	100.00%
<sup>a</sup> Based on fair value					

Most MBSs are pass-through securities, subject to the same interest and prepayment risks as the underlying mortgages. As discussed in the loans section below, the cash flows of many residential mortgages, and consequently the cash flows of pass-through MBSs, are highly uncertain due to prepayments.

Because prepayments result from home sales (most mortgages are not assumable) and refinancing, they are related to factors such as mortgage age (the probability of prepayment increases as the mortgage ages), borrower's income, geographic location and, most importantly, changes in interest rates since the mortgage was issued. Prepayment risk is the risk that actual prepayments will deviate from expectations. This risk is primarily affected by interest rate volatility: higher interest rate volatility implies greater likelihood of large interest rate changes which, in turn, affect the rate of

<sup>11</sup> This category includes collateralized mortgage obligations (CMOs), real estate mortgage investment conduits (REMICs), CMO and REMIC residuals, and stripped mortgage-backed securities (such as interest-only strips, principal-only strips and similar instruments).

prepayments. Prepayments may result in an economic loss, regardless of whether the MBS was purchased at par, premium or discount. However, unless the MBS is classified as a trading asset, the risk of an accounting loss exists only for securities which were purchased at a premium.

Structured MBSs are created by assembling other MBS or mortgages and using them as collateral for multi-class security offerings. Structured MBSs can be more or less risky than pass-through MBSs. For example, a significant portion of structured MBSs consist of Planned Amortization Class (PAC) securities which, by construction, have smaller prepayment risk than the underlying MBS.<sup>12</sup> In contrast, companion tranches (securities created in structured MBS securitization to absorb the prepayment risk of PAC and Targeted Amortization Class securities) are riskier than the underlying MBS. Also, Principal-Only and Interest-Only securities partition the cash flows of the underlying MBS in ways that increase prepayment risk for the resulting securities. BHCs that securitize mortgages often retain the riskier tranches.

As shown in Table III(C)(5), except for the very large BHCs, banks hold significant investments in structured MBSs. These investments often serve as natural hedges. For example:

- Some PAC securities have substantially shorter maturity and more predictable cash flows than the underlying MBS, therefore providing better matches for the cash outflows associated with the bank's liabilities.
- Mortgage servicing income is highly sensitive to mortgage prepayments. Thus, investing in stripped mortgage Principal-Only securities, whose values are positively related to prepayments, allows mortgage originators to hedge their servicing income.
- Interest-Only securities increase in value when interest rates rise and prepayments decline; consequently, they are often used to hedge fixed-rate investments against interest rate risk.

While MBS comprise more than 50% of securities, other securities holdings are also significant. Major types of securities other than MBS include:

*Treasury securities* (about 4.4% of securities holdings) – these securities have trivial credit risk and no prepayment risk and are highly liquid; their only exposure is interest rate risk.

*U.S. government agency obligations* (11.4% of securities holdings) – similar to Treasuries, these securities have trivial credit risk but significant interest rate

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<sup>12</sup> According to the Bond Market Association, PAC tranches are now the most common type of CMO tranche, constituting over 50% of the new-issue market.

risk.<sup>13</sup> Unlike Treasuries, many agency obligations have call provisions and hence prepayment risk. In addition, some agency securities have limited liquidity.

*Municipal bonds* (6% of securities holdings) – most municipal bonds have high credit quality, in many cases due to insurance.<sup>14</sup> The more significant exposures are interest rate risk and, for callable bonds, prepayment risk.

*Assets-backed securities (ABS)* (4.5% of securities holdings) – ABS are bonds or notes backed by financial assets, typically receivables other than mortgages. Table III(C)(6) presents the composition of asset-backed securities, measured using fair values.

<b>Table III(C)(6): Asset-Backed Securities Other Than MBS (ABS)</b>					
	All BHCs	Very Large BHCs	Large BHCs	Mid-sized BHCs	Small BHCs
<b><i>Economic significance:</i></b>					
Percentage of total securities	4.52%	5.55%	4.59%	0.72%	0.40%
Percentage of total assets	0.77%	0.84%	0.90%	0.19%	0.09%
Percentage of common equity	9.20%	10.52%	9.47%	2.06%	0.99%
<b><i>Composition:<sup>a</sup></i></b>					
Credit card receivables	34.80%	40.30%	18.45%	10.34%	13.61%
Home equity lines	30.83%	29.72%	35.26%	21.97%	29.60%
Automobile loans	11.38%	9.41%	17.49%	20.12%	9.07%
Other consumer loans	3.61%	2.82%	5.47%	8.96%	20.09%
Commercial and industrial loans	5.73%	4.85%	8.53%	8.52%	4.69%
All other	13.66%	12.90%	14.80%	30.09%	22.94%
	100.00%	100.00%	100.00%	100.00%	100.00%
<sup>a</sup> Based on fair value					

According to the Bond Market Association, more than 90% of outstanding ABS issues have an AAA credit rating. This is achieved through credit enhancements such as over-collateralization, reserve funds, surety bonds (i.e., insurance), third-part guarantees, and cash collateral accounts.

Home equity loans can be closed- or open-end. For securities backed by closed-end home equity loans, auto loans, manufactured-housing loans or other fully amortizing loans, prepayment is a key exposure. However, for auto loans and other small amount loans, prepayment is less systematically affected by interest rates, as compared with mortgages.

<sup>13</sup> This category includes Small Business Administration “Guaranteed Loan Pool Certificates,” U. S. Maritime Administration obligations, Export–Import Bank participation certificates, and obligations (other than mortgage-backed securities) issued by the Farm Credit System, the Federal Home Loan Bank System, the Federal Home Loan Mortgage Corporation, the Federal National Mortgage Association, the Financing Corporation, the Resolution Funding Corporation, the Student Loan Marketing Association, and the Tennessee Valley Authority.

<sup>14</sup> According to the Bond Market Association, almost half of all new municipal bond issues are insured.

Securitizations of credit card receivables, open-end home equity loans, and other revolving types of debts often use a controlled amortization structure. Consequently, they have limited prepayment risk.

According to the Mortgage Bankers Association, most MBS are structured securities, with cash flows divided into different tranches. Junior tranches bear most of the structure’s credit risk, while senior tranches are protected from borrower default by the junior tranches, which earn a higher return as compensation for bearing this additional risk.

Table III(C)(7) gives the remaining maturity distribution of all debt securities included in the held-to-maturity and available-for-sale portfolios.<sup>15</sup> The percentages are calculated using the reported book values (i.e., fair values for available-for-sale and amortized costs for held-to-maturity). Most securities have contractual maturities of more than 5 years. However, for many securities, especially MBS, the expected maturity is considerably shorter due to prepayments. According to the Bond Market Association, most mortgage pass-through securities are based on fixed-rate mortgage loans with an original maturity of 30 years, but most of these mortgages are paid off much earlier, on an average of over 10 to 12 years.

<b>Table III(C)(7): Remaining Maturity of Debt Securities</b>					
	All BHCs	Very Large BHCs	Large BHCs	Mid-sized BHCs	Small BHCs
1 year and less	11.07%	11.05%	10.87%	10.98%	12.24%
Over 1 year to 5 years	24.98%	23.91%	23.12%	27.22%	38.97%
Over 5 years	63.95%	65.05%	66.01%	61.79%	48.79%
	100.00%	100.00%	100.00%	100.00%	100.00%

According to the Bond Market Association, the overwhelming majority of bond trading takes place in over-the-counter markets, through a decentralized network of dealers and brokers. Most transactions are done with dealers. The vast majority of bonds are held by institutional investors.

With the exception of U.S. government securities, trading volume in fixed-income products is relatively low. New issues tend to trade actively for a few weeks or months after the issuance, but then, as they find their way to long-term portfolios, bonds trade much less frequently. Highly structured and subordinate securities tend to be the least liquid.

Empirical research in finance demonstrated a negative correlation between credit spreads and interest rates. Thus, under some circumstances, high credit risk portfolios may have lower price volatility,

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<sup>15</sup> Remaining maturity is the amount of time remaining from the report date until the final contractual maturity of the instrument without regard to the instrument’s repayment schedule.



compared with low credit risk portfolios. This follows because, for high credit risk portfolios, yield increases due to rising interest rates are partially offset by reductions in credit spreads.

#### ***C.4. Estimation and Limitations of Fair Value***

For most securities, market prices are available from active markets (e.g., published bid prices or quotations from dealers or market quote systems). However, some securities are traded in thin markets, suggesting that market prices may contain considerable measurement error (e.g., structured and high-yield securities). In addition, some securities are not traded at all. When market prices are not available, market quotes for comparable securities may be used instead. When traded comparable securities are not available, fair value may be estimated using discounted cash flow analysis, matrix models or other model-based valuation techniques.

Of all financial instruments, fair values of securities are perhaps the easiest to determine. Yet, implementing fair value accounting for securities does involve some limitations:

*Value in use.* For most securities, value at market equals value in use. However, for some securities, particularly strategic equity investments, value in use may deviate from market prices. The statistics reported in Table III(C)(4) and in Section III(F) show that BHCs have relatively small investments in equity securities.

*Measurement error and bias in fair value estimates of investment securities.* Market prices may be imprecise due to private information, low liquidity, or price bubbles. Given the composition of investment securities held by BHCs (reasonably liquid, low credit risk debt securities), measurement error and bias in fair value estimates are not primary concerns for most securities. However, for highly structured and illiquid securities, fair value estimates may contain significant bias and error.

*Correlation between the fair values of securities and other assets and liabilities.* Investments in debt securities are an important tool in asset-liability management. To reduce exposure to interest rate changes, some financial institutions invest in securities with interest rate sensitivities that offset those of other assets and liabilities. Thus, changes in the fair values of investment securities may be negatively related to changes in the fair values of other (net) assets. Two additional factors contribute to this negative correlation:

1. Investments in debt securities effectively offset the firm's own debt. Thus, changes in the fair value of debt are likely to offset changes in the fair value of investment securities.
2. The fair value of investment securities is typically negatively related to the value generated from customer relationships. While increases in interest rates reduce the fair value of fixed rate securities, they also increase the spread

between market interest rates and the cost of core deposits, thereby raising the value of the core deposit intangible.

Thus, if investment securities are marked-to-market while other interest rate-sensitive net assets are not, earnings and book value will be distorted. This is the primary concern when applying fair value to investment securities.

### **C.5. Academic Research**

Substantial research has examined the quality and information content of fair value estimates for securities. The primary findings of these studies are reviewed next.

*Incremental information in fair value estimates.* Many studies provided evidence that differences between the reported fair and book values of investment securities help explain the share prices of banks and insurance companies; see, for example, Barth (1994), Petroni and Wahlen (1995), Barth et al. (1996), Nelson (1996), Eccher et al. (1996), and Park et al. (1999). However, the information in fair value estimates is not necessarily incremental to that in historical cost-based measures of performance. For example, Nelson (1996) showed that after controlling for accounting profitability (ROE) and growth in book value, the fair value of securities does not exhibit a significant association with market value. Similarly, Eccher et al. (1996) concluded that after controlling for profitability, liquidity, and other historical cost-based ratios, the incremental information in the fair value of securities becomes marginal. Moreover, several studies have shown that some fair value estimates do not provide incremental information relative to book values. For example, Petroni and Wahlen (1995) found that while differences between the fair and book values of equity investments and U.S. Treasury securities help explain the share prices of property-liability insurers, those of other types of investment securities (e.g., municipal and corporate bonds) do not. In addition, Barth and Clinch (1998) showed that re-valuations of investments of non-financial Australian firms in associated companies are not significantly associated with share prices.

*Fair value versus historical cost.* Several studies have favorably compared the "informativeness" of fair value estimates with historical cost valuations. Barth (1994) found that historical cost measures of investment securities provide no significant explanatory power for share prices incremental to fair value. Khurana and Kim (2003) showed that the relationship of equity value with fair value estimates of investment securities is stronger than its relationship with the securities' book values.

*Incremental information in unrealized gains and losses.* While the evidence regarding the information content of fair value estimates is generally positive, corroboration for periodic unrealized

gains and losses is mixed. Barth (1994) found that unrealized gains and losses on investment securities do not explain stock returns. She offered two explanations for this result: (1) measurement error in the estimated unrealized gains and losses, and (2) the omission of correlated unrealized gains and losses on other assets and liabilities (e.g., loans and deposits). Consistent with the second explanation, Ahmed and Takeda (1995) showed that after controlling for interest rate sensitivity of other assets and liabilities, unrealized gains and losses on investment securities become positively related to stock returns. Similarly, Park et al. (1999) controlled for unrealized gains and losses on all SFAS No. 107 assets and liabilities, and found that those on investment securities are positively related to stock returns.

#### **D. Trading Assets**

BHCs report “trading assets” on the balance sheet if they (a) regularly underwrite or deal in securities, derivatives, commodities or other assets; (b) acquire or take positions in such items principally with the intent to resell in order to profit from short-term price movements; or (c) acquire or take positions in such items as an accommodation to customers or for other trading purposes.

Trading assets are carried at fair value, with realized and unrealized gains and losses reported in the income statement as part of trading revenue. Interest income on trading assets is reported separately.

Under Emerging Issues Task Force (EITF) Issue No. 02-3, “*Issues Involved in Accounting for Derivative Contracts Held for Trading Purposes and Contracts Involved in Energy Trading and Risk Management Activities*,” recognition of a trading profit at the inception of a derivative transaction is prohibited unless the fair value of that derivative is obtained from a quoted market price, supported by comparison with other observable market transactions, or based upon a valuation technique incorporating observable market data. In the absence of such market information, the gain or loss should be recognized over the life of the transaction.

The trading classification is uncommon, used primarily by the largest BHCs. For these firms, however, trading assets constitute a large percentage of total assets. Table III(D)(1) reports economic significance and composition ratios.

<b>Table III(D)(1): Economic Significance and Composition of Trading Assets</b>					
	All BHCs	Very Large BHCs	Large BHCs	Mid-sized BHCs	Small BHCs
<b><i>Economic significance:</i></b>					
Percentage of total assets	8.55%	11.57%	2.27%	0.18%	0.01%
Percentage of common equity	101.65%	144.45%	24.03%	1.90%	0.12%
<b><i>Composition:</i></b>					
U. S. Treasury securities in domestic offices	7.52%	7.71%	3.93%	2.73%	25.69%
U. S. government agency obligations in domestic offices (excluding MBS)	5.68%	5.80%	3.37%	7.73%	15.45%
Securities issued by states and political subdivisions in the U.S. in domestic offices	1.60%	1.52%	3.04%	5.30%	11.82%
Mortgage backed securities (MBS) in domestic offices	10.57%	10.52%	11.36%	10.20%	16.18%
Other debt securities in domestic offices	15.09%	15.52%	7.34%	0.61%	16.75%
Other trading assets in domestic offices	9.81%	9.29%	19.64%	12.23%	14.05%
Trading assets in foreign offices	21.92%	21.63%	26.41%	59.24%	0.00%
Revaluation gains on derivative contracts	27.83%	28.02%	24.91%	1.96%	0.05%
	100.00%	100.00%	100.00%	100.00%	100.00%

Trading assets include U.S. Treasury securities, U.S. government agency obligations, securities issued by states and political subdivisions in the U.S., MBS, and other debt instruments (corporate bonds, certificates of deposit, commercial paper, loans, banker acceptances, etc.). Importantly, trading assets also include revaluation gains from the “marking-to-market” of interest rate, foreign exchange rate, commodity, equity, and credit derivative contracts held for trading purposes. Many of these instruments are discussed in other sections of this document; in particular, the characteristics and risks of securities were discussed in Section III(C), and derivatives are discussed in Section V below.

## **E. Loans and Leases**

### ***E.1. Accounting Treatment and Classification***

Loans and leases are classified as either held-for-investment or held-for-sale. Loans and leases held for investment are reported on the balance sheet at the principal amount outstanding, net of unearned fee income, and the allowance for loan and lease losses. The allowance for loan and lease losses represents management’s estimate of the amount of loans and leases held for investment that the bank will be unable to collect, based on current information and events as of the date of the financial statements. Loans and leases held for sale are reported at the lower of cost or fair value. As shown in Table III(E)(1), the percentage of loans and leases classified as held-for-sale is typically small, especially for small BHCs.

<b>Table III(E)(1): Economic Significance and Classification of Loans and Leases</b>					
	All BHCs	Very Large BHCs	Large BHCs	Mid-sized BHCs	Small BHCs
<i>Economic significance:</i>					
Percentage of total assets	52.26%	48.63%	59.30%	60.63%	65.55%
Percentage of common equity	622.64%	610.24%	626.79%	651.62%	725.61%
<i>Classification:</i>					
Loans and leases held-for-sale	4.70%	5.45%	4.41%	1.83%	1.19%
Loans and leases held for investment, net	95.30%	94.55%	95.59%	98.17%	98.81%
	100.00%	100.00%	100.00%	100.00%	100.00%

While the allowance for loan and lease losses reflects current information regarding credit risk, it does not reflect the pricing of credit risk for the following reasons. First, the allowance reflects incurred but yet unconfirmed credit losses; it does not reflect anticipated losses (e.g., due to an expected recession) which have not been incurred as of the balance sheet date. Such expectations are likely to affect the fair value of loans. Second, the allowance measures the undiscounted amount that the bank expects to charge-off in the future due to incurred losses. That is, the allowance ignores the time value of money, which affects the pricing of credit risk. Third, the allowance does not reflect changes in credit spreads which are due to changes in investors' sentiment toward credit risk. Such changes obviously affect the prices of credit-risky loans.

Under SFAS 107, firms are required to disclose the estimated fair value of all loans (including loans held for sale), but there is no such requirement for leases.

<b>Table III(E)(2): Composition of Loans and Leases</b>					
	All BHCs	Very Large BHCs	Large BHCs	Mid-sized BHCs	Small BHCs
Loans secured by real estate	50.58%	46.43%	51.50%	67.38%	71.26%
Loans to depository institutions and acceptances of other banks	0.90%	1.08%	0.72%	0.53%	0.07%
Loans to finance agricultural production and other loans to farmers	0.59%	0.34%	0.42%	1.25%	3.13%
Commercial and industrial loans	21.02%	21.98%	20.44%	18.29%	15.95%
Consumer loans <sup>16</sup>	18.27%	20.56%	17.25%	9.62%	7.86%
Loans to foreign governments and official institutions	0.23%	0.34%	0.04%	0.03%	0.00%
All other loans	4.74%	5.31%	5.11%	1.69%	1.13%
Lease financing receivables	3.68%	3.95%	4.53%	1.21%	0.59%
	100.00%	100.00%	100.00%	100.00%	100.00%

<sup>16</sup> This item includes loans to individuals for household, family, and other personal expenditures.

## E.2. Composition

Table III(E)(2) presents the composition of banks' loan and lease portfolios, including loans held for sale but excluding loans held for trading and commercial paper. The percentages are based on gross book values before deducting unearned income and the allowance for loan and lease losses.

Loans secured by real estate are by far the largest category, followed by commercial and industrial loans, and consumer loans. Small BHCs have substantially larger investments in real estate loans, while large BHCs have larger investments in consumer loans, leases, and commercial and industrial loans.

Next examined is the composition of loans within two major categories: loans secured by real estate in Table III(E)(3), and consumer loans in Table III(E)(4).

<b>Table III(E)(3): Loans Secured by Real Estate</b>					
	All BHCs	Very Large BHCs	Large BHCs	Mid-sized BHCs	Small BHCs
<b><i>Economic significance:</i></b>					
Percentage of loans and leases	50.58%	46.43%	51.50%	67.38%	71.26%
Percentage of total assets	26.96%	23.06%	31.16%	41.50%	47.41%
Percentage of common equity	321.26%	289.31%	329.37%	446.03%	524.76%
<b><i>Composition:</i></b>					
Construction, land development, and other land loans	8.09%	4.94%	11.43%	14.31%	14.16%
Secured by farmland	1.10%	0.67%	0.67%	1.83%	4.51%
Revolving, open-end loans secured by 1-4 family residential properties and extended under lines of credit <sup>17</sup>	12.11%	13.19%	14.42%	6.60%	4.88%
Closed-end loans secured by 1-4 family residential properties, first liens	46.06%	54.03%	37.64%	29.68%	31.30%
Closed-end loans secured by 1-4 family residential properties, junior liens	4.75%	4.91%	5.60%	3.57%	2.83%
Secured by multifamily (5 or more) residential properties	3.46%	2.63%	4.93%	5.14%	3.45%
Loans secured by non-farm non-residential properties	20.21%	13.47%	23.93%	36.48%	38.85%
Foreign real estate loans	4.21%	6.16%	1.38%	2.39%	0.02%
	100.00%	100.00%	100.00%	100.00%	100.00%

The largest group of real estate loans, especially for very large BHCs, is that of closed-end loans secured by 1-4 family residential properties with first liens. As discussed below, these loans typically have readily available market prices and low credit risk. Commercial real estate loans (loans secured by non-farm non-residential properties, and construction and land development loans) constitute about 28% of total real estate loans. However, for small and mid-sized banks, commercial real estate loans

<sup>17</sup> These lines of credit, commonly known as home equity lines, are typically secured by a junior lien and are usually accessible by check or credit card.

constitute more than 50% of real estate loans. Revolving, open-end real estate loans are also significant, especially for large BHCs.

Many loans which are classified as commercial real estate loans are used by businesses to finance capital expenditures or operating expenditures rather than to purchase real estate. In many cases, firms may obtain cheaper funding for their business by pledging their real estate as collateral. Thus, at least a portion of commercial real estate loans included in “loans secured by nonfarm nonresidential properties” are more correctly described as commercial loans.

<b>Table III(E)(4): Consumer Loans</b>					
	All BHCs	Very Large BHCs	Large BHCs	Mid-sized BHCs	Small BHCs
<b><i>Economic significance:</i></b>					
Percentage of loans and leases	18.27%	20.56%	17.25%	9.62%	7.86%
Percentage of total assets	9.74%	10.21%	10.44%	5.93%	5.23%
Percentage of common equity	116.02%	128.12%	110.31%	63.68%	57.85%
<b><i>Composition:</i></b>					
Credit cards	36.03%	39.00%	34.19%	9.97%	6.47%
Other revolving credit plans	5.83%	6.28%	4.67%	5.31%	3.18%
Other consumer loans (includes single payment, installment, and all student loans)	58.14%	54.72%	61.14%	84.72%	90.35%
	100.00%	100.00%	100.00%	100.00%	100.00%

Credit card loans, which are held primarily by large BHCs, constitute about 36% of total consumer loans. Unfortunately, FR Y-9C reports do not provide details for the majority of consumer loans (“other consumer loans” represent 58% of the total). An examination of a sample of annual reports suggests that auto loans constitute a substantial category for many BHCs.

### ***E.3. Risk Exposures***

Similar to loan-backed securities, exposure for loans consists of credit risk, interest rate risk, and prepayment risk. However, unlike loan-backed securities which are typically credit enhanced, credit risk is the primary concern for many loans. We start with the analysis of credit risk and then discuss interest and prepayment risks.

To evaluate the credit risk of the different categories of loans, we examine two measures of credit quality: annualized net loan charge-off rates (Table III(E)(5)) and the ratio of problem loans to total loans (Table III(E)(6)).

Net loan charge-offs is the amount of loans written off as uncollectible during the quarter, net of recoveries on loans previously written off as uncollectible. To measure the rate of charge-offs, we

divide net loan charge-offs by the average of the beginning- and end-of-quarter balances of the related loan portfolio.

Problem loans are measured as the total of non-accrual loans and loans 30 days or more past due. The latter category increases the objectivity of this credit risk measure since banks exercise discretion in classifying loans as non-accrual.

Credit risk analysis typically involves the estimation of two quantities: “probability of default” and “loss given default.” The credit loss statistics in Table III(E)(5) reflect both quantities since loan charge-offs increase with the frequency and magnitude of losses. In contrast, the statistics in Table III(E)(6) primarily reflect the probability of loss—non-accrual and delinquent loans are more likely to generate losses, compared with performing loans. The ultimate losses from problem loans, however, vary considerably across loan categories.

	All BHCs	Very Large BHCs	Large BHCs	Mid-sized BHCs	Small BHCs
Construction, land development, and other land loans	0.11%	0.12%	0.08%	0.13%	0.10%
Secured by farmland	0.09%	0.09%	0.17%	0.10%	0.06%
Revolving, open-end loans secured by 1-4 family residential properties and extended under lines of credit	0.14%	0.15%	0.14%	0.10%	0.06%
Closed-end loans secured by 1-4 family residential properties, first liens	0.16%	0.19%	0.13%	0.07%	0.08%
Closed-end loans secured by 1-4 family residential properties, junior liens	0.51%	0.61%	0.40%	0.29%	0.24%
Closed-end loans secured by 1-4 family residential properties	0.22%	0.25%	0.16%	0.10%	0.09%
Secured by multifamily (5 or more) residential properties	0.04%	0.04%	0.03%	0.04%	0.07%
Loans secured by non-farm non-residential properties	0.11%	0.09%	0.13%	0.12%	0.09%
Foreign real estate loans	0.32%	0.35%	0.11%	0.09%	0.00%
Real estate—total	0.17%	0.21%	0.14%	0.11%	0.09%
Loans to depository institutions and acceptances of other banks	0.10%	0.12%	0.08%	-0.03%	-0.01%
Loans to finance agricultural production and other loans to farmers	0.37%	0.38%	0.56%	0.43%	0.22%
Commercial and industrial loans	1.08%	1.13%	1.16%	0.72%	0.63%
Credit card	5.17%	5.12%	5.08%	5.69%	16.3%
Other consumer loans	2.20%	2.52%	1.73%	0.93%	0.88%
Consumer loans—total	3.26%	3.52%	2.86%	1.39%	1.84%
Loans to foreign governments and official institutions	0.22%	0.22%	0.16%	0.03%	0.20%
All other loans	0.20%	0.19%	0.18%	0.40%	0.44%
Lease financing receivables	0.83%	0.88%	0.67%	1.07%	1.05%
Total	0.95%	1.11%	0.84%	0.36%	0.33%

The rate of credit losses is lowest for real estate loans and highest for consumer loans, especially credit card loans. Commercial and industrial loans are also quite risky. The riskiest category of real estate loans is that of closed-end loans secured by 1-4 family residential properties with junior liens. Perhaps surprisingly (given that title is retained by the bank), credit losses on leases are quite significant.



Credit losses increase monotonically with bank size. This is due in part to loan composition—large banks have substantially larger proportions of consumer and commercial loans than smaller banks. However, it appears that even within each loan category, large banks have bigger losses (see, e.g., credit losses on closed-end residential loans). These statistics explain the relatively large provisions for credit losses reported by large BHCs, as shown in Table II(C)(1).

The second metric of credit risk—the ratio of problem loans to total loans—generally ranks loans consistently with the rate of credit losses. However, the differences in problem loans across the categories are relatively small. In particular, the differences between the problem loan ratios for real estate loans and the ratios for commercial and consumer loans are substantially smaller than the corresponding differences in net charge-offs. This is due to the substantially lower values of “loss given default” for real estate loans, compared with other loans.

While the credit risk rankings in Tables III(E)(5) and III(E)(6) are generally consistent, one important exception is foreign loans. These loans had relatively low rates of credit losses during the sample period but very high problem loan ratios.

	All BHCs	Very Large BHCs	Large BHCs	Mid-sized BHCs	Small BHCs
Construction, land development, and other land loans	1.57%	1.75%	1.39%	1.50%	1.57%
Secured by farmland	2.44%	2.87%	2.92%	1.91%	2.04%
Revolving, open-end loans secured by 1–4 family Residential properties and extended under lines of credit	0.76%	0.76%	0.77%	0.69%	0.77%
Closed-end loans secured by 1–4 family residential Properties, first liens	2.62%	2.72%	2.75%	1.64%	1.93%
Closed-end loans secured by 1–4 family residential Properties, junior liens	2.47%	2.54%	2.52%	2.03%	2.05%
Closed-end loans secured by 1–4 family residential Properties Secured by multifamily (5 or more) residential properties	2.68%	2.81%	2.76%	1.74%	1.96%
Secured by multifamily (5 or more) residential properties	0.73%	0.61%	0.76%	0.85%	1.06%
Loans secured by nonfarm nonresidential properties	1.42%	1.39%	1.41%	1.44%	1.52%
Foreign real estate loans	4.92%	5.01%	4.87%	3.64%	1.95%
Real estate – total	2.13%	2.37%	1.92%	1.53%	1.65%
Loans to depository institutions and acceptances of other banks	0.63%	0.67%	0.61%	0.13%	1.21%
Loans to finance agricultural production and other loans to farmers	2.63%	3.28%	3.06%	2.28%	1.80%
Commercial and industrial loans	2.98%	3.14%	2.74%	2.48%	2.44%
Credit card	4.23%	4.29%	3.84%	4.78%	11.0%
Other consumer loans	3.41%	3.81%	2.61%	2.03%	2.45%
Consumer loans – total	3.70%	4.00%	3.03%	2.30%	3.00%
Loans to foreign governments and official institutions	4.99%	5.08%	2.00%	6.69%	0.00%
All other loans	0.99%	1.05%	0.70%	1.23%	2.05%
Lease financing receivables	2.01%	2.17%	1.53%	2.41%	2.79%
Total	2.53%	2.79%	2.20%	1.78%	1.90%

Credit risk is obviously not the only (and often not the primary) source of risk. In particular, interest rate and prepayment risks are significant exposures for many fixed rate loans, especially residential mortgages. Even for floating rate loans, interest rate and prepayment risks may be significant. Repricing intervals for some floating rate loans are quite lengthy, exposing lenders to non-trivial interest rate risk. This is especially true for hybrid floating rate loans, which carry fixed rates for several years after origination. In addition, some floating rate loans have caps, floors or both (collars), which are embedded interest rate derivatives. Floating rate loans with unrealized gains (e.g., due to improvement in borrowers' credit risk, narrowing of credit spreads, changes in interest rates or market power of lenders) can have significant prepayment risk.

Unfortunately, FR Y-9C reports provide little information to evaluate interest rate and prepayment risks.<sup>18</sup> Other sources (e.g., publications of the Mortgage Bankers Association and the Bond Market Association) indicate that most residential mortgages are fixed rate. For example, according to the Mortgage Bankers Association, the share of adjustable rate mortgages (ARMs) across all outstanding first mortgages was 23.3% in the first quarter of 2005. Moreover, many ARM mortgages are hybrids, with rates fixed for the first three or five years.

#### ***E.4. Estimation, Accuracy and Limitations of Fair Value***

Quoted market prices are unavailable for most loans. Even when available, market prices may not reflect the bank's private information. Thus, measuring fair value for most loans requires the use of valuation models. An important exception is the group of conforming residential real estate loans. Conforming loans (as defined by Fannie Mae or Freddie Mac) are those collateralized by one-to-four family residential real estate, having loan-to-collateral value ratios of 80% or less, made to borrowers with good credit standing, with balances smaller than an annually updated amount (\$359,650 in 2005). Conforming loans have active secondary markets, with prices readily available from market quote systems. Indeed, these loans are frequently sold by banks after origination. Non-conforming residential

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<sup>18</sup> For fixed rate loans, information useful for this purpose would include remaining maturity, yield and credit rating by category (e.g., residential real estate, commercial and industrial, consumer). For floating rate loans, relevant information includes repricing data (e.g., repricing intervals, caps and floors) and prepayment provisions.

real estate loans are less actively traded, although such loans have become increasingly liquid in recent years (especially prime non-conforming loans) due to the positive trend in private label securitizations (e.g., by Countrywide).

For loans with no active market, the most common approach for estimating fair value is discounted cash flow analysis. Another approach is multiple-based valuation—that is, fair value is calculated as the product of book value and the average price of comparable instruments per dollar of book value. For loans with embedded options which significantly affect their value (e.g., the option to prepay fixed rate mortgages), simulations are required to properly price the options. All three approaches—discounted cash flow, multiple valuation, and simulation—involve substantial discretion and approximations and, therefore, considerable potential for error. We next elaborate on these valuation approaches and the pricing of credit, prepayment, and interest rate risks.

Present value calculations require estimation of the amount, timing, and uncertainty of interest and principal payments. Uncertainty about these future cash flows is due to default and prepayment risks, which are affected by loan-specific and economy-wide factors. For floating rate loans, future cash flows are also directly affected by interest rates. However, our examination of SFAS 107 disclosures by a sample of companies indicates that most banks do not use discounted cash flow analysis to value floating rate loans; instead, they either report the fair value of floating rate loans as equal to their book value, or they use multiple-based valuations.

*The pricing of credit risk.* One approach for pricing credit risk is to estimate the expected amounts of credit losses, deduct those amounts from the contractual cash flows, and calculate the present value of *expected* cash flows using risk-free rates, possibly adjusted for systematic (but not credit) risk.<sup>19</sup> This approach is most practical for pools of similar loans for which expected losses are estimated, using statistical models based on information about the levels of and trends in credit quality indicators. Primary predictors of credit losses include: (1) gross and net charge-offs; (2) non-performing, restructured, and past due loans; (3) foreclosed properties; (4) gains and losses from operations and sales of foreclosed properties (which represent potential credit losses that are not

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<sup>19</sup> To see the importance of adjusting the risk free rate for the systematic nature of credit risk (i.e., for the negative correlation between default and overall economic conditions), consider the following two instruments: a zero coupon U.S. government security that pays \$1000 with ten years to maturity, and an identical corporate liability. Assume the price of the government security is \$385.54 (i.e., 10% yield-to-maturity), the probability of default for the corporate liability is 20%, and loss given default is 100%. The corporate liability has an expected cash flow of \$800, which is 20% smaller than the expected cash flow for the U.S. government obligation, but its price is likely to be more than 20% smaller. The reason is that the corporate liability is likely to default in situations where investors value cash most, i.e., when economic conditions are poor. Thus, the value of the corporate liability is smaller than the value obtained by discounting the expected cash flow (\$800) using the risk free rate (10%). Finance models, such as the CAPM, provide estimates of the required discount rate adjustment.

included in loan charge-offs); and (5) adequacy of collateral. The primary disadvantage of this approach is that it focuses on past experience to predict future credit losses, thereby exposing the estimates to the same limitation of historical cost accounting—untimely information. While credit risk models can be adjusted to reflect current economic conditions and trends, such adjustments involve substantial discretion.

Another approach for pricing credit risk is to calculate the present value of the *contractual* cash flows using a discount rate that includes a premium for credit risk. The credit risk premium can be estimated using credit spreads on recently originated loans with similar maturity and credit risk. The main problem with this approach is finding comparable loans. This is especially true for loans when the financial conditions of borrowers have deteriorated.

Under both approaches for pricing credit risk, the potential for error and bias is material. This is due to the managers' discretion in estimating expected credit losses and credit risk premiums. The precision of credit risk pricing is affected by many factors, including: (1) loan type (e.g., the pricing of consumer loans is typically more precise and less biased than that of commercial loans because the homogeneity of consumer loans facilitates statistical modeling); (2) concentration of credit to a single borrower, industry, geographic region, etc. (concentration of credit generally increases credit risk and reduces the precision of credit risk pricing); and (3) loan age (the potential for a significant change in a loan's credit risk increases with its age).

Recently, BHCs have been able to use credit derivative spreads to price the credit risk exposures of some loans. For example:

“Fair value for the wholesale loan portfolio is estimated primarily using the cost of credit derivatives, which is adjusted to account for the differences in recovery rates between bonds, on which the cost of credit derivatives is based, and loans.” (JPMorgan Chase 2004 annual report, page 123.)

As credit-derivative markets develop, the availability of market-based information to price credit risk is likely to improve. Still, credit derivatives are issued primarily on corporate bonds, which in turn are issued by large public corporations. Such loans represent only a fraction of outstanding loans and are held primarily by large BHCs.

*The pricing of prepayment risk.* The potential gain for a borrower from exercising her prepayment option is equal to the difference between the fair value of the loan assuming no prepayment and the prepayment amount. Accordingly, the likelihood of prepayment increases with this difference. Prepayment risk is also affected by the likelihood that the borrower will exercise her prepayment option. Both

components of prepayment risk are primarily influenced by the volatility of interest rates.<sup>20</sup> Thus, the pricing of prepayment risk involves modeling the statistical behavior of interest rates and the sensitivity of prepayments to different interest rate paths. This involves substantial discretion, which implies that the pricing of prepayment risk may contain considerable error and bias.

*The pricing of interest rate risk.* Unlike credit and prepayment risks, banks' ability to manipulate the pricing of interest rate risk is rather limited, since the required information for pricing this risk (loan maturities, contractual interest rates, etc.) is objective and verifiable. Accordingly, fair values are especially informative after large systematic changes in interest rates, which make interest rate provisions (e.g., fixed versus floating rate) particularly relevant for explaining changes in fair value.

When banks utilize book values to approximate the fair values of floating rate loans, or when they estimate fair value by discounting principal and interest payments using currently *offered* rates, the resulting estimates are likely to understate selling prices. This occurs because rates offered by banks typically include a profit margin. Indeed, when banks sell or securitize loans, they often recognize significant gains.<sup>21</sup>

The discussion thus far has focused on the quality of fair value estimates. However, even with precise estimates of fair values, it is not clear that reporting loans at fair value is the "best" accounting. Similar to securities, the fair value of fixed-rate loans is negatively related to that of the core deposit intangible. Thus, fair-valuing loans without recognizing the value of the core deposit intangible would induce artificial volatility and bias in earnings and book value. Loans' fair values may be correlated with the fair values of other assets and liabilities also due to cross-selling. Bank managers often view a particular loan as part of a "package" which includes other loans and deposits as well as anticipated transactions with the borrower. Thus, valuing a loan without marking-to-market the other components of the package may yield a distorted picture. Finally, the fair value of existing loans is often correlated with the value of lending intangibles—the ability to generate profits from future lending. Unlike the previous two sources of correlations, this relationship implies that fair valuing loans may reduce distortions rather than induce them.

### ***E.5. Academic Research***

The primary findings of research examining the information content and quality of fair value estimates for loans are summarized below.

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<sup>20</sup> Other determinants of the likelihood that a borrower will exercise her prepayment option include factors such as demographics and loan age.

<sup>21</sup> This is especially true for loans whose values are not likely to be materially affected by the bank's private information. When information asymmetry is a concern, loan selling prices may include a discount for moral hazard.

*Incremental information in fair value estimates.* Several studies have investigated whether SFAS 107 estimates of loans' fair values contain incremental information relative to the respective book values. Barth et al. (1996) concluded that the disclosed fair values contain incremental information, but Eccher et al. (1996), Park et al. (1999), and Nissim (2003) found incremental information only in limited settings (e.g., following substantial changes in interest rates), and Nelson (1996) found no incremental information at all.

*Measurement error in fair value estimates.* Barth et al. (1996), Eccher et al. (1996), Beaver and Venkatachalam (2003), and Nissim (2003) provided evidence that BHCs' disclosed loan fair values contain measurement errors. Barth et al. (1996) found that non-performing loans have incremental explanatory power for the market value of equity after controlling for loan fair values, suggesting that the disclosed fair value of loans does not completely reflect loan default risk. Eccher et al. (1996) found that the relationship between the fair value of loans and the market value of equity is stronger for smaller BHCs, suggesting that this is due to the lower level of measurement error in the fair value estimates of small homogenous loans which are typically held by small banks. Beaver and Venkatachalam (2003) found that the strength of the relationship between the market value of equity and the fair value of loans is correlated with proxies for the extent of measurement error in the fair value. Nissim (2003) found that proxies for credit quality and interest rate provisions of loans are more strongly related to the market value of equity than to the disclosed fair value of loans, suggesting that the fair values are measured with considerable error.

*Manipulation of fair value estimates.* Barth et al. (1996), Beaver and Venkatachalam (2003), and Nissim (2003) provided evidence that banks "manage" the disclosed fair value of loans. Barth et al. (1996) found that the relationship between the fair value of loans and the market value of equity is stronger for banks with relatively high capital ratios, and Beaver and Venkatachalam (2003) found that the difference between the fair and book values of loans is negatively related to regulatory capital. Both results are consistent with less healthy banks overstating the disclosed fair value of loans. Nissim (2003) found that the overstatement of the disclosed fair value of loans decreases with the BHC's performance and increases with both the bank's risk and with management's ability to manipulate the fair value.

*Fair value versus historical cost.* Khurana and Kim (2003) compared the relative explanatory power of the fair and book values of loans in explaining equity values. They found that for small BHCs and those with no analysts following, historical cost measures of loans are more informative than fair values.

*Credit losses.* Many studies have demonstrated that BHCs manipulate the allowance for loan losses and related income statement provision.<sup>22</sup> Their evidence suggests that fair value estimates for loans, if recognized in the financial statements, are not likely to fully reflect the pricing of credit risk. Indeed, Bernard et al. (1995) analyzed the Danish experience with mark-to-market accounting for banks and found evidence of delayed recognition of credit losses on loans.

*Summary of research.* Overall, the evidence from academic research suggests that fair value estimates for loans contain substantial measurement error and bias, and add little to historical cost information. Measurement error and bias are due primarily to the pricing of credit risk; the pricing of interest rate risk is less biased and more informative, especially following large interest rate changes. An important caveat, however, is that the studies discussed above generally used data up to the mid-1990s. In recent years there have been important developments in capital markets related to securitizations, credit derivatives, credit risk modeling, and other trends, which have likely improved the availability and precision of fair value information.

## F. Other Financial Assets

Table III(F)(1) presents statistics for financial assets other than those discussed above. Since the only common characteristic of these assets is their relatively small size, we do not treat them as a group but rather express each asset as a percentage of total assets. As the table shows, both the individual items and their total are relatively small for each of the BHC size groups.

	All BHCs	Very Large BHCs	Large BHCs	Mid-sized BHCs	Small BHCs
Investments in unconsolidated subsidiaries and associated companies	0.23%	0.25%	0.21%	0.13%	0.07%
Customers' liability on acceptances outstanding	0.12%	0.16%	0.05%	0.02%	0.00%
Accrued interest receivable	0.52%	0.53%	0.46%	0.50%	0.59%
Interest-only strips receivable	0.06%	0.07%	0.09%	0.02%	0.01%
Equity securities that do not have readily determinable fair values	0.63%	0.62%	0.66%	0.72%	0.61%
Other financial assets—total	1.56%	1.63%	1.47%	1.39%	1.28%

<sup>a</sup>All ratios are calculated relative to total assets.

Investments in unconsolidated subsidiaries and associated companies include equity instruments (common and preferred stock) and debt (bonds, notes, debentures, loans, and advances). Investments in common stock are reported using the equity method. Under this method, the carrying value of the

<sup>22</sup>For example, Beaver et al. (1989), Moyer (1990), Elliott et al. (1991), Griffin and Wallach (1991), and Wahlen (1994).

investment is originally recorded at cost, but is adjusted periodically to record as income the BHC's proportionate share of the investee's earnings or losses, and it is decreased by the amount of any cash dividends received from the investee. Investments in debt instruments are accounted for using the effective rate method, similar to held-to-maturity securities and loans held-for-investment.

Customers' liability on acceptances outstanding represents the bank's claim against costumers for outstanding drafts and bills of exchange that have been accepted by the BHC.

Accrued interest receivable represents the amount of interest earned or accrued on earning assets that has not yet been collected.

Interest-only strips receivable (not in the form of a security and other than those held for trading purposes) are contractual rights to receive some or all of the interest due on bonds, mortgage loans, collateralized mortgage obligations or other interest-bearing financial assets. Interest-only strips receivable are measured at fair value on the balance sheet, with unrealized gains (losses) reported in "accumulated other comprehensive income."

Equity securities that do not have readily determinable fair values are reported at historical cost, with dividends included in income when declared. An equity security does not have a readily determinable fair value if sales or bid-and-asked quotations are not currently available on a securities exchange registered with the SEC and are not publicly reported by the NASDAQ systems or the National Quotation Bureau. This item includes investments in equity instruments of private companies, some investments in foreign companies, some restricted stock, and investments in the stock of Federal Reserve Banks, Federal Home Loan Banks, and other bankers' banks.

## **G. Premises and Equipment**

"Premises and equipment" includes all fixed assets which are used by the bank for operating activities. These assets are carried at cost less accumulated depreciation and amortization, and are subject to an impairment test under SFAS 144. Capital leases are included in premises and equipment at the capitalized amount less accumulated amortization. Unfortunately, no information is provided in FR Y-9C reports on the composition of premises and equipment or any other related data (e.g., depreciation). This is consistent with the fact that banks' investments in fixed assets are typically small, especially for large BHCs.



<b>Table III(G)(1): Economic Significance of Premises and Equipment</b>					
	All BHCs	Very Large BHCs	Large BHCs	Mid-sized BHCs	Small BHCs
Percentage of total assets	1.00%	0.81%	1.28%	1.57%	1.95%
Percentage of common equity	11.92%	10.11%	13.55%	16.85%	21.61%

## H. Intangible Assets

Intangible assets result primarily from business combinations, from acquisitions of portions or segments of another institution's business such as branch offices, mortgage servicing portfolios, and credit card portfolios, and from the sale or securitization of financial assets with servicing retained. Table III(H)(1) displays statistics on the economic significance and composition of intangible assets. Intangibles are significant for large and very large BHCs, but not for small BHCs. This is consistent with the fact that small BHCs typically do not engage in business combinations or securitization. Interestingly, while the economic significance of intangibles differs considerably across the size-based sample, their composition is quite stable, with approximately 70% representing goodwill and 10% mortgage servicing rights.

<b>Table III(H)(1): Economic Significance and Composition of Intangible Assets</b>					
	All BHCs	Very Large BHCs	Large BHCs	Mid-sized BHCs	Small BHCs
<b><i>Economic significance:</i></b>					
Percentage of total assets	3.01%	3.27%	3.10%	1.75%	0.54%
Percentage of common equity	35.82%	41.00%	32.71%	18.76%	5.95%
<b><i>Composition:</i></b>					
Goodwill	72.39%	72.24%	72.05%	76.97%	72.65%
Mortgage servicing rights	12.47%	13.04%	11.52%	6.83%	8.98%
Purchased credit card relationships and non-mortgage servicing assets	5.57%	5.07%	8.64%	0.79%	0.71%
Other	9.57%	9.65%	7.79%	15.42%	17.67%
	100.00%	100.00%	100.00%	100.00%	100.00%

Goodwill represents the amount by which the cost of net assets acquired in a business combination exceeds their fair value. Under SFAS No. 142, goodwill and other intangible assets deemed to have indefinite lives are not amortized, but instead are tested for impairment annually or more frequently if events or changes in circumstances indicate that the asset might be impaired. For indefinite-life intangibles, the impairment test consists of a comparison of fair and book values. If book value exceeds fair value, the intangible asset is written down to its fair value and an impairment loss is recognized. For goodwill, the impairment test has two steps. First, the fair value of each reporting unit

is estimated and compared with the unit's book value. If the unit's fair value is smaller than its book value, then the implied fair value of goodwill—that is, the excess of the unit's fair value over the fair value of net identifiable assets—is calculated. Impairment loss is recognized if the implied fair value of goodwill is smaller than its book value.

Mortgage servicing rights (MSRs) represent the right to service mortgages owned by others. MSRs are either purchased from other companies or result from securitizations in which servicing rights are retained. The current accounting treatment for servicing rights is as follows (note that, as discussed below, this treatment will soon change). Servicing rights retained in the securitization of mortgages are initially measured by allocating the carrying value of the loans between the assets sold and the interests retained, based on the relative fair values at the date of securitization. According to FASB Statement No. 140, the fair value of mortgage servicing assets is the amount at which the assets could be bought or sold in a current transaction between willing parties, that is, other than in a forced or liquidation sale. However, due to the limited availability of transaction prices, BHCs typically estimate the fair value of MSRs by calculating the present value of forecasted net servicing income. This approach requires estimates of prepayment speeds, discount rates, servicing costs, escrow account earnings, contractual servicing fee income, ancillary income, and late fees.

MSRs are then amortized in proportion to, and over the period of, estimated net servicing income. Each quarter, MSRs are also evaluated for possible impairment. This is done on a disaggregated basis by predominant risk characteristics of the underlying financial assets such as loan type and interest rate band. Any excess of the carrying value of the capitalized servicing rights over the fair value by stratum is recognized through a valuation allowance for each stratum and charged to the provision for impairment on MSRs. If it is later determined that all or a portion of the temporary impairment no longer exists for a particular risk stratification, the valuation allowance is reduced through an increase to net income. Other-than-temporary impairment of MSRs is evaluated by considering historical and projected trends in interest rates, pay-off activity, and whether the impairment could be recovered through interest rate increases. A direct write-down is recognized when the recoverability of a recorded valuation allowance is remote. A direct write-down permanently reduces the carrying value of the MSRs, while a valuation allowance (temporary impairment) can be reversed.

In March 2006, the FASB issued SFAS 156 which (1) requires that MSRs be initially measured at fair value, and (2) permits entities to subsequently measure servicing assets using either the

provisions of SFAS 140 (discussed above) or fair value on each reporting date, with changes in fair value included in earnings.

The measurement of MSRs involves substantial discretion. In its 2005 annual report, Wells Fargo notes:

“Our significant accounting policies ... are fundamental to understanding our results of operations and financial condition, because some accounting policies require that we use estimates and assumptions that may affect the value of our assets or liabilities and financial results. Three of these policies are critical because they require management to make difficult, subjective and complex judgments about matters that are inherently uncertain and because it is likely that materially different amounts would be reported under different conditions or using different assumptions. These policies govern the allowance for credit losses, the valuation of mortgage servicing rights and pension accounting.”  
(page 38)

BHCs are required to report the estimated fair value of capitalized mortgage servicing assets in the FR Y-9C report. Since MSRs are currently reported at the lower of cost or market, the reported fair values should be at least as large as the carrying amount in all cases. The statistics in Table III(H)(2) appear to suggest otherwise—for more than 10% of MSRs, fair value is smaller than the carrying amount. However, this is probably due to the omission of fair values of some MSRs that are arguably difficult to estimate.

	All BHCs	Very Large BHCs	Large BHCs	Mid-sized BHCs	Small BHCs
Net unrealized gains on MSRs as a % of their book value	1.90%	1.52%	2.39%	9.87%	9.72%
Proportion of balances with net gains (including 0 gain)	88.21%	86.10%	96.06%	97.31%	96.48%
Net gains as a % of book value of gain positions	2.58%	1.87%	4.17%	10.38%	10.70%
Proportion of balances with net losses	11.79%	13.90%	3.94%	2.69%	3.53%
Net losses as a % of book value of loss positions	-3.17%	-0.63%	-41.2%	-8.60%	-17.2%

Purchased credit card relationships (PCCRs) represent the right to conduct ongoing credit card business dealings with cardholders. In general, PCCRs are amounts paid in excess of the value of the purchased credit card receivables. Such relationships arise when a banking organization purchases existing credit card receivables, along with the right to provide credit card services to those customers. PCCRs are also recognized when the reporting BHC acquires an entire depository institution. PCCRs are amortized over their estimated useful life and are reviewed for impairment whenever events or changes in circumstances indicate that the carrying amount may not be recoverable. Such events and

circumstances include unanticipated acceleration or deceleration of cardholder payments, account attrition or changes in fees or finance charges. If the review indicates that the carrying amount may not be recoverable, an impairment loss equal to the amount by which the carrying amount exceeds the PCCRs' fair value is recognized. The carrying amount is not recoverable if it exceeds the sum of the undiscounted expected net cash flows from the PCCRs. An impairment loss is recognized by writing the PCCRs down to their fair value, with a corresponding charge to expense. Subsequent reversal of a previously recognized impairment loss is prohibited.

Non-mortgage servicing assets represent the right to service financial assets other than mortgages, which are owned by others. They are either purchased from other companies or result from securitization in which servicing rights are retained. Non-mortgage servicing rights are accounted for in a way similar to MSRs.

“Other intangible assets” consists of customer relationships, the net present value of future economic benefits to be derived from the purchase of core deposits (core deposit intangible), favorable leasehold rights, and other intangible assets. Some of these intangibles are classified as having indefinite lives and are therefore accounted for similar to goodwill. Intangible assets with finite lives are accounted for similar to PCCRs.

## I. Other Assets

Included in this category are other real estate owned (OREO), the net deferred tax asset, and all assets other than those identified thus far. As with “other financial assets,” since the only common characteristic of these assets is their small size, we do not treat them as a group but rather express each asset as a percentage of total assets. As shown in Table III(I)(1), OREO and the net deferred tax asset constitute very small percentages of total assets. Unfortunately, most of the assets in this category are not identified in FR Y-9C reports.

	All BHCs	Very Large BHCs	Large BHCs	Mid-sized BHCs	Small BHCs
Real estate acquired in satisfaction of debts previously contracted	0.05%	0.04%	0.04%	0.07%	0.11%
Other OREO	0.07%	0.09%	0.01%	0.03%	0.03%
Total OREO	0.11%	0.13%	0.05%	0.09%	0.14%
Net deferred tax assets	0.16%	0.14%	0.19%	0.26%	0.17%
Other	5.29%	6.16%	4.33%	1.77%	1.14%
Other assets—total	5.67%	6.56%	4.63%	2.20%	1.59%

<sup>a</sup>All percentages are calculated relative to total assets.

Other real estate owned consists of two categories: real estate acquired in satisfaction of debts previously contracted, and “other OREO.” The latter category includes real estate acquired and held for investment, and real estate originally acquired for expansion or previously used for operations, which are no longer used for these purposes.

Foreclosed real estate received in full or partial satisfaction of a loan is initially recorded at fair value less estimated cost to sell the property. When foreclosed real estate is received in full satisfaction of a loan, the amount, if any, by which the recorded amount of the loan exceeds the fair value less selling cost, is charged to the allowance for loan and lease losses. If the fair value less selling cost exceeds the loan’s recorded amount, the excess should be reported as a recovery of a previous charge-off or in current earnings, as appropriate.

After foreclosure, each individual foreclosed real estate asset must be carried at the lower of cost or fair value less selling cost as of the reporting date. This determination is made on an asset-by-asset basis. If the fair value less selling cost is smaller than the cost of the asset, the deficiency is recognized as a valuation allowance against the asset which is created through a charge to expense. The valuation allowance should thereafter be increased or decreased (but not below zero) through charges or credits to expense for changes in the asset’s fair value or estimated selling costs.

The deferred tax asset represents expected future tax savings due to existing temporary differences between the book and tax bases of the BHC’s assets and liabilities. Because deferred taxes are undiscounted, their book value overstates the fair value. The deferred tax asset is reduced by a valuation allowance, which measures the portion of the asset not likely to be realized. The measurement of this allowance involves substantial discretion. Deferred taxes are reported net on the balance sheet—either a net asset or a net liability, depending on whether the deferred tax asset is larger or smaller than the deferred tax liability.

#### IV. Analysis of Liabilities

##### A. Federal Funds Purchased and Securities Sold under Agreements to Repurchase

Federal funds purchased are funds borrowed from other financial institutions under agreements or contracts that have an original maturity of one business day or that roll over under a continuing contract. These transactions may be secured or unsecured or may involve an agreement to repurchase loans or other instruments that are not securities.

Securities sold under agreements to repurchase are funds borrowed under agreements to repurchase securities (or participations in pools of securities). That is, the BHC “sells” to the lender securities, which are effectively used as collateral for the loan. At maturity, the BHC “purchases” back identical, or substantially identical securities, for an amount specified in the agreement. These transactions typically have maturities ranging from overnight to up to a year. Securities sold under agreements to repurchase are reported on the balance sheet at the amount at which the securities ultimately will be repurchased, including accrued interest.

	All BHCs	Very Large BHCs	Large BHCs	Mid-sized BHCs	Small BHCs
<b><i>Economic significance:</i></b>					
Percentage of total assets	10.00%	11.21%	8.64%	6.82%	2.07%
Percentage of common equity	119.13%	140.53%	91.22%	73.61%	22.90%
<b><i>Composition:<sup>a</sup></i></b>					
Federal funds purchased in domestic offices	17.21%	11.90%	42.44%	21.78%	23.52%
Securities sold under agreements to repurchase	82.79%	88.10%	57.56%	78.22%	76.48%
	100.00%	100.00%	100.00%	100.00%	100.00%

<sup>a</sup>The composition data are for the period Q1:02-Q3:05.

Table IV(A)(1) presents statistics describing the economic significance and composition of federal funds purchased and securities sold under repurchase agreements. Overall, these funds constitute 10% of total assets or about 119% of total equity—clearly a very significant source of funds. A comparison of these statistics with investments in federal funds sold and securities purchased, as discussed in Section III(B), reveals that BHCs are net borrowers in these markets, since the latter instruments constitute less than 7% of total assets.

For small BHCs, federal funds purchased and securities sold are relatively insignificant sources of funds. For larger BHCs, especially very large BHCs, these funds are quite material. Unlike the

distribution of federal funds sold/securities purchased, which exhibits a strong correlation with size, the size correlation is weaker here. Still, very large banks have higher proportions of securities sold.

Table IV(A)(2) presents an analysis of the excess yield on federal funds purchased and securities sold. As discussed in Section III(B), securities purchased/sold may have substantially longer maturities than federal funds (up to a year, compared to overnight) and may therefore have higher interest rate risk. Accordingly, the average yields in Table IV(A)(2) generally increase with the proportion of securities sold, consistent with a positive relationship between yield and maturity. One exception is that small banks have relatively low yields despite a relatively large proportion of securities sold. A possible explanation for this result is that small banks engage in short-term (e.g., overnight) securities sold transactions as a substitute for federal funds, since they may not be able to borrow unsecured funds.

<b>Table IV(A)(2): Cost of Federal Funds Purchased and Securities Sold under Agreements to Repurchase</b>					
	All BHCs	Very Large BHCs	Large BHCs	Mid-sized BHCs	Small BHCs
Annualized yield on federal funds purchased and securities sold under agreements to repurchase	2.95%	3.10%	2.37%	2.55%	2.16%
Annualized excess yield on federal funds purchased and securities sold under agreements to repurchase	0.91%	1.05%	0.36%	0.56%	0.13%
Proportion earning positive excess yield	82.72%	87.74%	65.75%	59.01%	50.31%
Annualized positive excess yield	1.17%	1.25%	0.66%	1.21%	0.72%
Proportion earning negative excess yield	17.28%	12.27%	34.25%	40.99%	49.69%
Annualized negative excess yield	-0.34%	-0.39%	-0.22%	-0.38%	-0.48%

## **B. Trading Liabilities**

Trading liabilities include liability for short positions and revaluation losses on derivative contracts. Liability for short positions results from sales of assets that the BHC does not own. Revaluation losses on derivative contracts are liabilities resulting from marking-to-market of interest rate, foreign exchange rate, commodity, equity, and credit derivative contracts held for trading purposes. Trading liabilities are reported on the balance sheet at fair value, with unrealized gains/losses recognized in earnings. Interest expense on trading account liabilities is reported as a reduction of interest revenues from trading activities.

Table IV(B)(1) reports statistics on the economic significance and composition of trading liabilities. Similar to trading assets, small and mid-sized BHCs have very little trading liabilities. In contrast, very large BHCs have substantial amounts of trading liabilities. Still, investments in trading

assets (discussed in Section III(D)) are about twice as large as trading liabilities, indicating that very large BHCs commit significant amounts of capital to support trading activities. Overall, trading liabilities are distributed equally between liability for short positions and revaluation losses on derivatives.

<b>Table IV(B)(1): Economic Significance and Composition of Trading Liabilities</b>					
	All BHCs	Very Large BHCs	Large BHCs	Mid-sized BHCs	Small BHCs
<i><b>Economic significance:</b></i>					
Percentage of total assets	4.34%	5.99%	0.82%	0.02%	0.00%
Percentage of common equity	51.73%	75.13%	8.69%	0.19%	0.01%
<i><b>Composition:</b></i>					
Liability for short positions	52.02%	52.67%	34.30%	82.05%	97.84%
Revaluation losses on derivative contracts	47.98%	47.34%	65.70%	17.95%	2.16%
	100.00%	100.00%	100.00%	100.00%	100.00%

## C. Deposits

### C.1. Accounting Treatment, Composition and Risk

Deposits with no stated maturities are reported on the balance sheet at the amount payable on demand. Time deposits are reported at the amount deposited plus accrued interest, which in turn is equal to the present value of the promised cash flows discounted at the contractual (historical) yields.

Under SFAS No. 107, firms are required to disclose fair value estimates for financial instruments, including deposits. However, for deposits with no defined maturities, the disclosed fair value is the amount payable on demand (i.e., the book value). This is an important limitation of current fair value disclosures. For most banks, the economic liability associated with core deposits is considerably smaller than the amount payable on demand because the cost of these liabilities is typically below market interest rates.

Table IV(C)(1) presents statistics describing the economic significance and composition of deposits. Most deposits are interest-bearing, especially those in foreign offices. Large and very large BHCs have larger proportions of non-interest-bearing deposits, compared to small and mid-sized BHCs (20% versus 15%). The very large BHCs have substantial amounts of deposits in foreign offices, but the large majority of BHCs have no foreign deposits at all.



<b>Table IV(C)(1): Economic Significance, Interest Rate Provisions, and Location of Deposits</b>					
	All BHCs	Very Large BHCs	Large BHCs	Mid-sized BHCs	Small BHCs
<i>Economic significance:</i>					
Percentage of total assets	54.03%	49.15%	58.96%	72.32%	80.72%
Percentage of common equity	643.81%	616.79%	623.12%	777.92%	893.47%
<i>Composition:</i>					
Non-interest-bearing deposits in domestic offices	17.89%	18.32%	18.55%	15.37%	15.31%
Non-interest-bearing deposits in foreign offices	1.40%	2.07%	0.35%	0.18%	0.00%
Interest-bearing deposits in domestic offices	60.87%	51.47%	72.16%	82.70%	84.64%
Interest-bearing deposits in foreign offices	19.84%	28.15%	8.95%	1.75%	0.05%
	100.00%	100.00%	100.00%	100.00%	100.00%

Table IV(C)(2) reports the relative magnitudes of the different types of deposits in domestic offices (comparable information for foreign deposits is unavailable). Overall, money market and savings deposits constitute about 54% of total deposits, time deposits account for about 29%, and the remaining 17% are transaction accounts. The proportion of money market and savings accounts is positively and strongly related to size, while the converse is true for time deposits.

<b>Table IV(C)(2): Composition of Domestic Deposits</b>					
	All BHCs	Very Large BHCs	Large BHCs	Mid-sized BHCs	Small BHCs
Demand deposits	12.61%	12.84%	12.30%	11.51%	13.37%
NOW, ATS, and other transaction accounts	4.10%	3.08%	3.27%	5.91%	10.53%
Money market deposit accounts and other savings accounts	54.34%	61.68%	50.87%	42.78%	31.63%
Non-brokered time deposits of less than \$100,000	12.56%	6.12%	17.69%	22.04%	27.63%
Brokered time deposits of less than \$100,000	2.51%	4.10%	0.39%	0.59%	0.56%
Time deposits of \$100,000 or more	13.89%	12.18%	15.49%	17.18%	16.28%
	100.00%	100.00%	100.00%	100.00%	100.00%

Non-interest-bearing foreign deposits and domestic deposits other than brokered time deposits and time deposits of \$100,000 or more are considered “core.” Core deposits constitute a relatively stable and cheap source of funds. Interestingly, the statistics in Table IV(C)(2) show that for all size groups, about 83-84% of domestic deposits are core. However, since domestic deposits constitute a much larger proportion of total assets for small BHCs, the relative magnitude of core deposits is negatively related to bank size.

Table IV(C)(3) gives the maturity/repricing distribution of time deposits. As shown, most interest-bearing deposits mature or reprice within a year, suggesting that they have little interest rate

risk. In addition, early withdrawal penalties are typically large enough to make the risk of early withdrawal negligible.

	All BHCs	Very Large BHCs	Large BHCs	Mid-sized BHCs	Small BHCs
Time deposits that mature or reprice within one year	83.86%	85.21%	75.20%	89.80%	87.93%
Fixed-rate long-term time deposits	16.14%	14.79%	24.80%	10.20%	12.07%
	100.00%	100.00%	100.00%	100.00%	100.00%

### **C.2. Estimation of Fair Value**

Because market values are not available for deposits, fair values have to be estimated. Most deposits are federally insured, and so there is essentially no credit risk for the depositor. For depositors, the fair value of insured deposits is equal to the present value of the promised cash flows discounted at the risk-free rate. However, for the bank, the value of the liability is smaller. The credit enhancement of deposits is supplied by the federal government, not by the bank. While banks pay an FDIC insurance premium, the amount they pay is smaller than the economic benefit. To estimate the value of deposit liabilities, therefore, one should calculate the present value of net cash flows to depositors, using a discount rate that reflects the bank’s credit risk, similar to the valuation of regular uninsured debt instruments.<sup>23</sup> The cash flows should include principal and interest payments as well as servicing costs and other cash outflows (e.g., the FDIC insurance premium), which are required to maintain and service the deposits. To the extent that deposit-taking activities generate cash inflows (e.g., deposit fees), those cash flows should be netted against the cash outflows.

For most time deposits, given the required credit risk premium, estimation of fair value is straightforward since prepayment risk is relatively low (due to significant early withdrawal penalties and short maturity). In contrast, the pricing of deposits with no defined maturity is quite difficult. Customers deposit and withdraw funds from core deposits on a routine basis, but typically maintain an average positive balance with the bank. Thus, for core deposits, it is more appropriate to value existing deposits together with the value added from future deposits—that is, the core deposit intangible. This requires estimates of the impact of factors such as (1) competition from other financial instruments or

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<sup>23</sup>SFAS No. 107 is not clear about this issue. It suggests (but does not require) that “the discount rate could be the current rate offered for similar deposits with the same remaining maturities” (¶ 29). However, examination of disclosures by several banks indicates that some include a risk premium in the discount rate. For example, US Bancorp state in their 2002 annual report that “the fair value of fixed-rate certificates of deposit was estimated by discounting the contractual cash flow using the discount rates implied by the high-grade corporate bond yield curve” (p. 96).

other products (e.g., strong stock market performance may promote depositors to divert funds from deposits to mutual funds or stocks); (2) demographic characteristics of the investor base (e.g., young people are more likely to invest in other products); (3) technological improvements (that can reduce the cost of servicing deposits, but may also create alternative investment products for depositors); and (4) cost of servicing the deposits (e.g., federal deposit insurance premium, marketing costs, cost of holding supporting non-earning assets). Extrapolations from historical experience may be problematic.

### ***C.3. Academic Research***

Barth et al. (1996), Eccher et al. (1996), Nelson (1996), and Park et al. (1999) found that the disclosed fair value of deposits does not contain incremental information relative to historical cost. They suggested that this may result from the SFAS No. 107 requirement that deposits with no defined maturity be stated at the amount payable on the reporting date (which generally equals the book value). Khurana and Kim (2003) found that for small bank holding companies, and those not followed by analysts, historical cost measures of deposits are more informative than fair values.

## **D. Debt**

### ***D.1. Accounting Treatment and Composition***

Debt instruments are reported on the balance sheet at historical cost adjusted for amortization of premiums, discounts, and fees. Since BHCs typically use the effective interest rate method of amortization, the book value of debt is equal to the present value of future cash flows discounted at the historical yields. Under SFAS 107, firms are required to disclose the estimated fair value of debt.

Table IV(D)(1) presents statistics on the economic significance and composition of debt instruments. For large and very large BHCs, debt constitutes a significant source of funds—more than 15% of total funds and almost twice the level of equity. For small and mid-sized BHCs, debt is of the order of magnitude of equity financings. FR Y-9C reports provide little information on the composition of debt instruments, with more than 78% of total debt classified as “other.” The types of debt instruments identified in the report—subordinated notes and debentures, and commercial paper—are mostly issued by large BHCs.

<b>Table IV(D)(1): Economic Significance and Composition of Debt</b>					
	All BHCs	Very Large BHCs	Large BHCs	Mid-sized BHCs	Small BHCs
<i>Economic significance:</i>					
Percentage of total assets	14.84%	15.55%	16.21%	9.12%	6.61%
Percentage of common equity	176.46%	194.69%	171.33%	97.98%	73.11%
<i>Composition:<sup>a</sup></i>					
Subordinated notes and debentures	12.55%	13.56%	11.83%	3.69%	1.02%
Commercial paper	8.97%	10.92%	4.45%	1.60%	0.27%
Other borrowed money	78.48%	75.51%	83.73%	94.71%	98.70%
	100.00%	100.00%	100.00%	100.00%	100.00%

<sup>a</sup>The composition data are for the period Q1:02-Q3:05.

## D.2. Risks and Estimation of Fair Value

Table IV(D)(2) presents the remaining maturity/repricing distribution of debt. About 65% of BHCs' debt instruments mature or reprice within a year. Thus, the interest rate exposure of these instruments appears rather limited. Small BHCs have less debt, but their debt has longer maturity and so is more sensitive to interest rate changes.

<b>Table IV(D)(2): Maturity/Repricing of Debt</b>					
	All BHCs	Very Large BHCs	Large BHCs	Mid-sized BHCs	Small BHCs
Debt maturing in one year or less	43.51%	44.58%	42.90%	34.11%	30.22%
Debt maturing in more than one year, but reprices within one year	21.43%	23.73%	16.27%	10.72%	13.46%
Debt maturing/repricing in more than one year	35.06%	31.70%	40.84%	55.18%	56.32%
	100.00%	100.00%	100.00%	100.00%	100.00%

Debt maturing in one year or less includes all commercial paper. These instruments are typically very short-term and issued by large, safe BHCs. Accordingly, the book value of these instruments approximates their fair value.

Subordinated notes and debentures could involve significant credit risk (they are unsecured and subordinated to all deposits and secured debt), but are typically issued by large diversified BHCs which are less likely to default (and may be "too big to fail"). Thus, the major risk associated with these instruments is interest rate risk.

## D.3. Academic Research

The evidence on the usefulness of fair value disclosures for debt under SFAS 107 is mixed. Barth et al. (1996) found that the disclosed fair value of debt provides significant explanatory power for the share

prices of banks, beyond that provided by historical costs. In contrast, Nelson (1996) and Eccher et al. (1996) generally found that the estimated fair value of debt has no additional explanatory power after controlling for historical cost.

### E. Other Liabilities

This category includes all liabilities other than those discussed above. Since the only common characteristic of these items is their small size, we do not treat them as a group but rather express them as a percentage of total assets. For large and, particularly, very large BHCs, these liabilities constitute a large proportion of total assets. Unfortunately, FR Y-9C reports provide little information on these items. For at least some BHCs, “other” includes substantial insurance reserves.

	All BHCs	Very Large BHCs	Large BHCs	Mid-sized BHCs	Small BHCs
Liability on acceptances executed and outstanding	0.12%	0.16%	0.04%	0.02%	0.00%
Allowance for credit losses on off-balance sheet credit exposure	0.03%	0.03%	0.03%	0.01%	0.00%
Net deferred tax liability	0.47%	0.45%	0.78%	0.12%	0.05%
Other	7.27%	9.04%	4.30%	1.64%	1.03%
Other liabilities—total	7.88%	9.67%	5.15%	1.80%	1.09%

<sup>a</sup>All items are expressed as percentages of total assets.

## V. Derivatives and Off-balance-sheet Items

### A. General

Table V(A)(1) presents the notional amounts of derivatives and off-balance-sheet items, expressed as a percentage of total assets. Derivatives and off-balance sheet instruments are used primarily by large BHCs. The total notional amount of derivatives is almost nine times total assets, indicating the economic significance and potential risks associated with these activities. The total notional amount of off-balance sheet items is substantially smaller than that of derivatives, with commitments constituting the majority of these instruments. Both derivatives and off-balance sheet items have a strong positive relation with size. This is particularly true for derivatives.

	All BHCs	Very Large BHCs	Large BHCs	Mid-sized BHCs	Small BHCs
Commitments	55.19%	57.18%	70.27%	18.97%	13.39%
Letters of credit	4.90%	5.73%	4.10%	1.43%	0.66%
All other off-balance-sheet items (excluding derivatives)	16.16%	17.28%	21.09%	1.02%	0.18%
Credit derivatives	19.37%	27.61%	0.73%	0.02%	0.01%
Derivatives (other than credit)	864.78%	1218.05%	81.80%	7.29%	0.75%
Total	960.41%	1325.83%	177.98%	28.73%	14.98%

<sup>a</sup>All ratios are calculated relative to total assets.

As discussed below, all derivatives are reported on the balance sheet at fair value. In contrast, off-balance sheet items are generally not marked-to-market. Some instruments are not recognized at all, while others may generate one or both of the following liabilities: (1) liability for unearned credit extension fees or for stand-ready obligations, and (2) allowance for credit losses on off-balance sheet credit exposures.

Credit extension fees are initially recognized as an unearned revenue liability and are reported in income either at the termination of the commitment or over the life of the loan if the loan commitment is drawn. A liability for stand-ready obligation is recognized at the inception of some guarantees, including standby letters of credit (FASB Interpretation No. 45). This liability is initially measured at fair value. If the guarantee is issued to an unrelated party in a single-element transaction, fair value is measured as the premium to be received by the guarantor. Otherwise, fair value has to be estimated. Some companies value guarantees using the expected present value approach, that is, considering the probability, timing, and magnitude of possible cash flows associated with the guarantee. Other companies use credit derivative data as the basis for estimating the fair value of some

guarantees. FASB Interpretation No. 45 does not describe in detail how the guarantor’s liability for its obligations under the guarantee should be measured subsequent to initial recognition, but notes (paragraph 12) that the liability typically would be reduced by a credit to earnings as the guarantor is released from risk under the guarantee. BHCs generally recognize fee income from standby letters of credit ratably over the terms of the letters.

The allowance for credit losses on off-balance sheet credit exposures (often referred to as the reserve for unfunded lending commitments) is a liability account serving to absorb estimated credit losses associated with off-balance-sheet credit instruments, such as off-balance sheet binding unfunded loan commitments, letters of credit, and guarantees. The book value of this liability represents estimated probable credit losses in these off-balance sheet credit instruments and is measured based on utilization assumptions, historical loss experience, current economic conditions, performance trends within specific portfolio segments, and any other pertinent information.

## **B. Commitments**

Table V(B)(1) gives the distribution of commitments to make or purchase extensions of credit in the form of loans or participations in loans, lease financing receivables or similar transactions. Commitments that meet the SFAS No. 133 definition of a derivative instrument (e.g., mortgage interest-rate lock commitments, loan commitments to originate or acquire mortgage loans that will be resold as part of an institution’s mortgage banking operations) are excluded from this table and are analyzed in Section V(E) below.

<b>Table V(B)(1): Commitments</b>					
	All BHCs	Very Large BHCs	Large BHCs	Mid-sized BHCs	Small BHCs
Home equity lines	6.57%	6.16%	6.68%	14.02%	14.87%
Credit card lines	53.21%	51.76%	63.35%	14.49%	5.08%
Commercial real estate, construction, and land development	3.53%	2.19%	4.27%	24.58%	31.08%
Securities underwriting	0.05%	0.02%	0.13%	0.00%	0.01%
Other unused commitments	36.65%	39.86%	25.58%	46.91%	48.96%
Total	100.00%	100.00%	100.00%	100.00%	100.00%

Credit card lines constitute the majority of commitments. These are unsecured commitments that are not legally binding; accordingly, banks typically do not recognize any liability for these commitments. Commitments for commercial real estate, construction, and land development loans are significant for small and mid-sized BHCs, but not for large BHCs. Most commercial loan commitments are included in “other unused commitments.” Because this item also includes retail check credit and related plans,

overdraft protection programs, and some commitments to extend credit secured by 1-4 family residential properties, the magnitude of non-real estate commercial loan commitments cannot be gauged from FR Y-9C reports. An examination of a sample of annual reports suggests that many banks, especially large ones, have significant commercial lines of credit. Lev and Ryan (2004) discussed the accounting for commercial loan commitments and reviewed the disclosures of JP Morgan Chase, Citigroup, and Bank of America. The following discussion is based on their analysis.

Many commercial loan commitments contain “material adverse change” (MAC) clauses or other provisions intended to relieve the issuer of its funding obligations under certain conditions. Still, business enterprises are willing to pay significant loan commitment fees, and banks recognize significant reserves for expected loan losses on undrawn loan commitments, suggesting that lenders are not likely to invoke MAC clauses too frequently. Lev and Ryan (2004) explain this as follows:

“It is well known that a major reason for banks to extend loan commitments is to enhance business relationships with borrowers. Loan commitments are often bundled with or followed by additional business, such as securities underwriting. Obviously, a bank’s refusal of a draw request will seriously harm such relationships. Furthermore, a lender’s reputation for a quick finger on the MAC trigger will harm the bank’s credit and perhaps other business development activities. Issuers of loan commitments are also concerned with the potential legal liability that arises from a refusal of a draw request on a loan commitment on the basis of a MAC clause that subsequently leads to the customers’ bankruptcy. Many MAC clauses are general and qualitative (e.g., “a material impairment in the ability of Borrower to perform...”) and therefore open to dispute and interpretation in legal proceedings.” (pages 16-17)

### **C. Letters of Credit**

FR Y-9C reports provide data on three types of letters of credit: financial standby, performance standby, and commercial. A financial standby letter of credit obligates the BHC to pay a third-party beneficiary when a customer fails to repay an outstanding loan or debt instrument (e.g., customer’s payment of commercial paper). A performance standby letter of credit obligates the BHC to pay a third-party beneficiary when a customer fails to perform some contractual non-financial obligation (e.g., delivery of merchandise, completion of a construction contract, release of maritime liens). Commercial letters, which are used to facilitate trade or commerce, obligate the BHC to make payments to a third party on the customer’s behalf. Commercial letters of credit are usually collateralized by the underlying goods being shipped to the customer and are generally short-term. Under the terms of financial and performance standby letters, drafts will be drawn only when the underlying event fails to occur as intended. In contrast, under the terms of commercial letters of credit,



drafts will be drawn when the underlying transaction is consummated as intended. While letters of credit expose the corporation to credit risk, in many cases banks hold collateral against these letters.

Table V(C)(1) presents the distribution of letters of credit based on the outstanding unused amount of credit, as of the balance sheet date. As shown, most letters of credit are financial standby letters of credit, which are in effect very similar to credit derivatives.

	All BHCs	Very Large BHCs	Large BHCs	Mid-sized BHCs	Small BHCs
Financial standby letters of credit	73.41%	72.22%	81.04%	65.21%	57.56%
Performance standby letters of credit	19.36%	20.14%	14.34%	23.55%	34.08%
Commercial letters of credit	7.23%	7.65%	4.62%	11.24%	8.36%
Total	100.00%	100.00%	100.00%	100.00%	100.00%

#### **D. Credit Derivatives**

Credit derivatives are arrangements that allow one party (the protection buyer or beneficiary) to transfer credit risk of a reference asset, which it may or may not own, to one or more other parties (the protection sellers or guarantors). Credit derivatives are used to mitigate or assume specific forms of credit risk. They are accounted for similar to other derivatives, as discussed in the next section. Here we describe the more common types of credit derivatives and examine their economic significance.

The most common form of credit derivative is a credit default swap—agreement between two parties whereby one party (the beneficiary) pays the other (the guarantor) a fixed coupon over a specified term. The guarantor makes no payment unless a specified credit event such as a default occurs, at which time a payment is made and the swap terminates. A credit default swap is a refined form of a traditional financial guarantee, with the difference that a credit swap need not be limited to compensation upon an actual default, but might even cover such events as downgrading.

Other types of credit derivatives may in fact cover additional risks besides credit. For example, in total rate of return swaps, the protection buyer agrees to periodically pay the total return from a credit asset (actual cash flow and price change) in exchange for a predetermined return (e.g., LIBOR + premium). In equity default swaps, the triggering event for payment by the guarantor is a substantial and non-transient decline in the market value of equity.

Some credit derivatives package derivative with non-derivative instruments. Credit-linked notes offer a return which is linked to credit events. For example, interest may be delayed or forgone if a reference credit asset defaults. Thus, the issuer of the note effectively sells regular debt and buys protection against default of the reference credit asset.

Unfortunately, FR Y-9C reports do not detail the types of credit derivatives used by BHCs. Instead they provide information on notional amounts and fair values separately for derivatives where the BHC is guarantor and beneficiary. The statistics in Table V(D)(1) suggest that banks use credit derivatives almost equally to assume and mitigate credit risk.

<b>Table V(D)(1): Credit Derivatives by Notional Amount<sup>a</sup></b>					
	All BHCs	Very Large BHCs	Large BHCs	Mid-sized BHCs	Small BHCs
BHC is guarantor	47.25%	47.33%	36.05%	75.79%	23.42%
BHC is beneficiary	52.75%	52.67%	63.95%	24.21%	76.58%
Total	100.00%	100.00%	100.00%	100.00%	100.00%

<sup>a</sup>Data cover the period Q1:02-Q3:05.

Table V(D)(2) presents information about the fair values of credit derivatives. On average, net fair value is positive for credit derivatives where the BHC is the guarantor and negative where the BHC is the beneficiary. This suggests that banks using credit derivatives to assume credit risk on average profit from these activities, while banks that use credit derivatives to mitigate credit risk on average lose. However, because most credit derivatives terminate when a credit event occurs, the fair value of existing derivatives likely provides a biased indication of gains and losses from these transactions.

<b>Table V(D)(2): Fair Value of Credit Derivatives<sup>a</sup></b>					
	All BHCs	Very Large BHCs	Large BHCs	Mid-sized BHCs	Small BHCs
<b><i>BHC is guarantor:</i></b>					
Gross positive fair value	0.91%	0.91%	1.18%	0.27%	5.29%
Gross negative fair value	0.64%	0.63%	1.96%	0.18%	2.28%
Net fair value	0.27%	0.28%	-0.78%	0.09%	3.01%
<b><i>BHC is beneficiary:</i></b>					
Gross positive fair value	0.78%	0.78%	0.83%	38.74%	56.62%
Gross negative fair value	0.90%	0.90%	1.62%	1.65%	10.35%
Net fair value	-0.12%	-0.12%	-0.79%	37.09%	46.28%

<sup>a</sup>Percentages are calculated based on notional amounts; data cover the period Q1:02-Q3:05.

Unfortunately, because FR Y-9C reports do not provide information on the notional amounts of gain and loss positions, it is impossible to estimate the probability of loss or to compare the magnitude of losses with the notional amounts of loss positions. (As discussed in Section III, such statistics inform on the risk of the related instruments.) However, the statistics in Table V(D)(2) do suggest that the potential magnitude of gains and losses from these activities is not negligible, even when compared with the total notional amount. Assuming that the notional amounts of gain and loss positions are

approximately equal, the statistics in Table V(D)(2) suggest that the magnitude of unrealized gains and losses on credit derivatives, expressed as a percentage of notional amount, is comparable with that of securities (see Section III(C)). Unlike securities, however, the notional amount of credit derivatives is excluded from the balance sheet (only unrealized gains and losses are reported). Thus, the fair value volatility of credit derivatives, expressed as a percentage of their book value, could be as much as 100 times larger than that of securities.

## **E. Derivatives (Other than Credit)**

### ***E.1. Accounting Treatment***

Under SFAS No. 133, all derivatives are recognized as either assets or liabilities on the balance sheet and are measured at fair value. The accounting treatment for changes in the fair value of derivatives (i.e., gains and losses) depends on whether the derivatives have been designated and qualify as part of a hedging relationship and, further, on the type of hedging relationship.<sup>24</sup> For derivatives that are not designated as hedging instruments, the gain or loss is recognized in earnings in the period of change.

A derivative that is designated and qualifies as a hedging instrument must be categorized as either a fair value hedge, a cash flow hedge, or a hedge of a net investment in foreign operations. A fair value hedge is used to hedge changes in the fair value of existing assets, liabilities, and firm commitments against changes in interest rates, foreign exchange rates, equity prices, commodity prices or other economic factors. Gain or loss on these derivatives, as well as the related gain or loss on the hedged item underlying the hedged risk, is recognized in earnings during the period in which the fair value changes. Thus, if a fair value hedge is perfectly effective, the change in the fair value of the hedged item will be offset, resulting in no net effect on earnings.

A cash flow hedge is used to hedge the variability of future cash flows against changes in interest rates or other economic factors. The effective portion of a gain or loss on any cash flow hedge is reported as a component of accumulated other comprehensive income (loss) and reclassified into earnings in the same period or periods in which the hedged transaction affects earnings. Any ineffective portion of the derivative gain or loss is recognized in earnings during the current period.

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<sup>24</sup>To qualify for hedge accounting, the hedge has to be effective; that is, changes in the fair value of a derivative instrument should offset changes in the fair value of the hedged item. If the relationship between the change in the fair value of the derivative instrument and the hedged item falls within a specified range, the hedge is considered effective and qualifies for hedge accounting. Ineffectiveness exists to the extent that the offsetting difference between the fair values falls outside the acceptable range.

Gains or losses on derivatives designated as hedging the foreign currency exposure of a net investment in a foreign operation are reported in other comprehensive income (outside earnings) as part of the cumulative translation adjustment.

The current accounting treatment for derivatives has several limitations, including the reporting of hedged items at amounts other than fair value (accrual basis or lower of cost or market), the discretion in hedge classification, and the rules on hedge documentation. These issues are discussed next.

*Hedged items reported at amounts other than fair value.* When both the hedged item and the hedging derivative are marked-to-market, the balance sheet and income statement appropriately reflect net value and change in value, respectively. However, when the hedged item is reported at an amount other than fair value, book value and earnings may be distorted.

#### Credit derivative

“The credit derivatives used by JPMorgan Chase for portfolio management activities do not qualify for hedge accounting under SFAS 133, and therefore, effectiveness testing under SFAS 133 is not performed. These derivatives are reported at fair value, with gains and losses recognized as Trading revenue. The marked-to-market value incorporates both the cost of credit derivative premiums and changes in value due to movement in spreads and credit events; in contrast, the loans and lending-related commitments being risk-managed are accounted for on an accrual basis. Loan interest and fees are generally recognized in Net interest income, and impairment is recognized in the Provision for credit losses. This asymmetry in accounting treatment, between loans and lending-related commitments and the credit derivatives utilized in portfolio management activities, causes earnings volatility that is not representative, in the Firm’s view, of the true changes in value of the Firm’s overall credit exposure.” (J.P. Morgan Chase 2005 Annual Report)

#### Loans held for sale:

“A mortgage banking company that uses derivatives to hedge its loan production activities is exposed to the risk that the values of the derivatives could decline without offset (in the financial statements) for an increase in the values of the hedged loans (above amortized cost). To mitigate this earnings risk, most mortgage companies today seek to qualify their loan production hedging activities for hedge accounting treatment under FAS 133. Under that Statement, if a loan qualifies as a fair value hedged item, increases in the value of the loan can be recognized above cost. However, the requirements for achieving hedge accounting treatment are extremely difficult to meet.” (Reporting Mortgage Loans Held for Sale at Fair Value, Issue Paper, Mortgage Bankers Association, October 2005)

### Mortgage servicing rights (MSRs):

“A mortgage banking company that uses derivatives to hedge its MSR portfolio is exposed to income statement volatility during rising interest rate environments because the values of derivatives decrease with the fluctuation reflected in the income statement, while the increase in the MSR values cannot be fully reflected (i.e. above amortized cost) in the income statement. Thus, the current accounting rules expose these companies to significant potential earnings volatility, particularly during periods of rising interest rates.” (Reporting Mortgage Servicing Rights at Fair Value, Issue Paper, Mortgage Bankers Association, October 2005)<sup>25</sup>

*Classification.* The same derivative position can often be classified as either a fair value or cash flow hedge. For example, a bank that has fixed rate loans and variable rate debt can classify an interest rate swap in which it receives variable interest and pays fixed as either a fair value hedge of the loan portfolio or a cash flow hedge of the debt. The impact of this discretion, however, is typically small. The primary effect on the financial statements is that the cash flow hedge classification results in higher book value volatility, since changes in the derivative fair value are included in comprehensive income. (For fair value hedges, changes in the derivative fair value are offset by changes in the fair value of the hedged item.)

*Documentation requirements.* To qualify for hedge accounting, firms are required to prepare detailed documentation of the hedge and its effectiveness. If at any point in time any deficiencies in the documentation become apparent, hedge accounting is discontinued and its impact on the financial statement is reversed. Thus, firms can insert hidden errors in hedge documentations and reveal them if the derivative positions generate gains.

#### ***E.2. Classification***

Unfortunately, FR Y-9C reports do not present derivatives by the SFAS 133 classifications discussed above. Instead, BHCs are required to classify derivatives based on the underlying activity—trading versus other-than-trading. “Trading derivatives” are those held for trading or to hedge trading activities, and are reported on the balance sheet as part of trading assets (gain positions) or trading liabilities (loss positions). Table V(E)(1) presents the distribution of derivatives by predominant exposure—interest rate, foreign exchange rate, equity prices, and prices of commodity and other contracts—for trading and other-than-trading derivatives separately. As expected, interest rate

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<sup>25</sup>In March 2006 the FASB issued SFAS 156 which permits entities to measure servicing assets and liabilities at fair value at each reporting date and report changes in fair value in earnings in the period in which the changes occur.

derivatives represent the large majority of derivatives, with foreign exchange contracts being a distant second.

	All BHCs	Very Large BHCs	Large BHCs	Mid-sized BHCs	Small BHCs
Trading—interest rate	82.66%	83.23%	53.76%	32.14%	7.26%
Trading—foreign exchange	11.85%	11.68%	21.73%	3.22%	1.18%
Trading—equity	1.43%	1.42%	1.76%	0.32%	0.01%
Trading—commodity and other	0.42%	0.41%	1.35%	0.05%	0.01%
Trading—total	96.36%	96.73%	78.59%	35.73%	8.45%
Other-than-trading—interest rate	3.46%	3.10%	20.35%	60.86%	88.80%
Other-than-trading—foreign exchange	0.17%	0.16%	1.04%	2.39%	0.22%
Other-than-trading—equity	0.01%	0.00%	0.02%	1.02%	2.48%
Other-than-trading—commodity and other	0.00%	0.00%	0.00%	0.00%	0.06%
Other-than-trading—total	3.64%	3.27%	21.41%	64.28%	91.55%

<sup>a</sup>Percentages are calculated based on notional amounts.

Most BHCs have no derivatives in the trading classification. However, since derivatives are used primarily by the largest BHCs, which employ derivatives almost exclusively for trading purposes, more than 96% of all derivatives (based on notional amounts) are classified as trading, with fair values reported on the balance sheet (trading assets and liabilities) and unrealized gains and losses included in income.

	All BHCs	Very Large BHCs	Large BHCs	Mid-sized BHCs	Small BHCs
Trading—interest rate	75.76%	76.32%	44.80%	10.15%	11.71%
Trading—foreign exchange	15.53%	15.39%	23.89%	4.00%	0.85%
Trading—equity	3.68%	3.68%	3.74%	1.05%	0.34%
Trading—commodity and other	2.21%	2.14%	5.97%	0.10%	0.54%
Trading—total	97.18%	97.53%	78.41%	15.30%	13.44%
Other-than-trading—interest rate	2.52%	2.20%	19.87%	67.58%	71.53%
Other-than-trading—foreign exchange	0.28%	0.25%	1.61%	5.59%	8.57%
Other-than-trading—equity	0.02%	0.02%	0.11%	10.93%	6.46%
Other-than-trading—commodity and other	0.00%	0.00%	0.00%	0.60%	0.01%
Other-than-trading—total	2.82%	2.47%	21.59%	84.70%	86.56%

<sup>a</sup>Percentages are calculated based on fair values.

Table V(E)(2) gives the distribution of derivatives recognized as assets (positive fair value), and Table V(E)(3) gives the distribution of derivatives recognized as liabilities (negative fair value). The distributions of derivative assets and liabilities are generally similar. In both cases, the primary group is that of interest rate contracts classified as trading. However, while these contracts constitute more

than 82% of the total notional amount of derivatives, as seen in Table V(E)(1), they account for only 76% of fair value. In contrast, commodity contracts constitute only about 0.4% of the total notional amount of derivatives, but more than 2% of the value of derivative assets and liabilities. These statistics suggest that the fair value volatility of interest rate contracts is on average smaller than that of other contracts.

	All BHCs	Very Large BHCs	Large BHCs	Mid-sized BHCs	Small BHCs
Trading—interest rate	76.14%	76.59%	48.97%	11.94%	7.34%
Trading—foreign exchange	15.85%	15.69%	26.27%	4.09%	0.00%
Trading—equity	3.87%	3.86%	4.59%	1.82%	0.01%
Trading—commodity and other	2.33%	2.27%	6.43%	0.26%	0.01%
Trading—total	98.19%	98.41%	86.26%	18.10%	7.35%
Other-than-trading—interest rate	1.54%	1.39%	10.31%	71.36%	78.06%
Other-than-trading—foreign exchange	0.25%	0.20%	3.36%	4.59%	0.87%
Other-than-trading—equity	0.01%	0.01%	0.06%	5.95%	13.68%
Other-than-trading—commodity and other	0.00%	0.00%	0.00%	0.00%	0.04%
Other-than-trading—total	1.81%	1.59%	13.74%	81.90%	92.65%

<sup>a</sup>Percentages are calculated based on fair values.

### ***E.3. Composition and Risk***

Derivatives consist of futures, forwards, options, and swaps. With the exception of options, these instruments typically involve no cash payment at the time of origination and present off-balance sheet risk. In contrast, purchased options are paid for at the time of purchase and present no off-balance sheet risk (the risk is limited to the book value of the investment). Table V(E)(4) gives the composition of derivatives based on notional amounts.

Futures and some option contracts are traded on exchanges. All other derivatives are traded over-the-counter. As shown in Table V(E)(4), futures and exchange-traded options constitute less than 11% of the total notional amount of derivatives, implying that exchange-based market prices are not available for the large majority of derivatives. Moreover, while futures and exchange-traded options have trivial credit risk (the exchanges act as the counterparty to each contract), other derivatives typically have non-trivial credit risk. More than 57% of the total notional amount consists of interest-rate swaps.

	All BHCs	Very Large BHCs	Large BHCs	Mid-sized BHCs	Small BHCs
Future contracts—interest rate	5.32%	5.27%	7.87%	8.24%	0.48%
Future contracts—foreign exchange	0.04%	0.04%	0.05%	0.02%	0.02%
Future contracts—equity	0.11%	0.11%	0.27%	0.00%	0.00%
Future contracts—commodity and other	0.05%	0.05%	0.25%	0.00%	0.00%
Future contracts—total	5.52%	5.47%	8.43%	8.26%	0.51%
Forward contracts—interest rate	6.83%	6.85%	5.91%	7.41%	28.20%
Forward contracts—foreign exchange	7.32%	7.12%	17.87%	3.83%	1.34%
Forward contracts—equity	0.01%	0.01%	0.03%	0.00%	0.01%
Forward contracts—commodity and other	0.08%	0.07%	0.47%	0.00%	0.00%
Forward contracts—total	14.24%	14.05%	24.28%	11.24%	29.55%
Exchange-traded written options—interest rate	2.11%	2.11%	2.13%	2.28%	0.69%
Exchange-traded written options—foreign exchange	0.02%	0.01%	0.10%	0.03%	0.00%
Exchange-traded written options—equity	0.22%	0.22%	0.10%	0.22%	0.13%
Exchange-traded written options—commodity and other	0.01%	0.01%	0.03%	0.00%	0.00%
Exchange-traded written options—total	2.36%	2.36%	2.36%	2.52%	0.82%
Exchange-traded purchased options—interest rate	2.37%	2.33%	4.29%	23.54%	0.55%
Exchange-traded purchased options—foreign exchange	0.02%	0.02%	0.12%	0.03%	0.00%
Exchange-traded purchased options—equity	0.23%	0.23%	0.11%	0.27%	0.00%
Exchange-traded purchased options—commodity and other	0.02%	0.02%	0.03%	0.00%	0.00%
Exchange-traded purchased options—total	2.63%	2.58%	4.55%	23.83%	0.55%
OTC written options—interest rate	6.47%	6.40%	10.55%	8.53%	15.48%
OTC written options—foreign exchange	1.13%	1.12%	1.37%	0.74%	0.00%
OTC written options—equity	0.35%	0.35%	0.18%	0.23%	0.94%
OTC written options—commodity and other	0.08%	0.08%	0.19%	0.04%	0.02%
OTC written options—total	8.03%	7.95%	12.29%	9.54%	16.44%
OTC purchased options—interest rate	5.94%	5.89%	8.67%	10.59%	12.11%
OTC purchased options—foreign exchange	1.10%	1.10%	1.37%	0.74%	0.00%
OTC purchased options—equity	0.32%	0.33%	0.18%	0.52%	0.59%
OTC purchased options—commodity and other	0.09%	0.08%	0.23%	0.00%	0.05%
OTC purchased options—total	7.46%	7.40%	10.45%	11.85%	12.75%
Swaps—interest rate	57.06%	57.50%	34.69%	32.42%	38.54%
Swaps—foreign exchange	2.41%	2.42%	1.89%	0.23%	0.03%
Swaps—equity	0.20%	0.18%	0.91%	0.10%	0.81%
Swaps—commodity and other	0.09%	0.09%	0.16%	0.00%	0.00%
Swaps—total	59.76%	60.20%	37.65%	32.76%	39.38%
Total	100.00%	100.00%	100.00%	100.00%	100.00%

<sup>a</sup>Percentages are calculated based on notional amounts.

#### ***E.4. Estimation of Fair Value***

As discussed above, exchange-based market prices are available for less than 11% of derivatives. For some derivatives, quotes are available from brokers/dealers or other market participants and can be



used to estimate fair value. However, most derivatives do not have market prices or quotes, so their fair values have to be estimated. A commonly used approach for estimating derivative fair values is to calculate the present value of expected future cash flows. Another approach is to base the fair value estimates on prices of recent transactions with similarly rated counterparties or on current quotes for similar instruments. As discussed in Section III(E)(4), both approaches are also used to value loans. Thus, the same issues that apply to the estimation of loan fair values are also relevant for derivatives. Due to their leverage, estimation errors for derivative fair values are likely to be larger than for loans.

Other valuation models price derivatives relative to the underlying assets (e.g., option pricing models). These models involve potential error from two sources: (1) error due to inaccurate model assumptions (e.g., the assumption that changes in the price of the underlying asset are continuous), and (2) error in parameters (e.g., estimated volatility of the underlying).

Even when estimated precisely, fair values do not reflect the potential for future changes in value, that is, the risk of the instrument. This limitation is especially relevant for derivatives which, due to their leverage and option characteristics, have substantially higher risk compared to non-derivative instruments. Moreover, for most derivatives that are recognized as assets, book value does not represent the maximum exposure (options are an exception). Accordingly, disclosures on risk and characteristics are especially important for derivatives.

#### ***E.5. Academic Research***

Most studies found that fair value estimates for derivatives, disclosed under SFAS 107 and SFAS 119, have little or no ability to explain the share prices of financial or non-financial firms (e.g., Barth et al. (1996), Eccher et al. (1996), Nelson (1996), Park et al. (1999), Wong (2000), and Simko (1999)). The only exception is Venkatachalam (1996), who found that fair value estimates for derivatives help explain cross-sectional variation in bank share prices and have incremental explanatory power over and above the derivatives' notional amounts.

## **VI. Conclusion**

Proponents of fair value accounting view the banking industry as a setting where fair valuing assets and liabilities is especially desirable. They point out that most reported assets and liabilities of banks are financial instruments which either have quoted market prices or are relatively easy to value. This study provides an in-depth analysis of the types, magnitudes, characteristics, and accounting treatments of the various economic assets and liabilities of banks. Its primary objective is to inform on the applicability of fair value accounting in the banking industry and the desirability of adopting standards which will expand fair value reporting. The analyses of this study are also relevant for users of banks' financial information, including bank analysts and investors, since they inform on drivers of value and risk in the banking industry and discuss accounting issues. The primary conclusion from the analysis is that expanding fair value requirements is not likely to significantly improve bank financial statements and, at least in some cases, may introduce distortions and thus reduce accounting quality. A summary of the findings leading to this inference is provided in Section I.

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