CHAPTER 21

VALUING FINANCIAL SERVICE FIRMS

Banks, insurance companies and other financial service firms pose particular challenges for an analyst attempting to value them for two reasons. The first is the nature of their businesses makes it difficult to define both debt and reinvestment, making the estimation of cash flows much more difficult. The other is that they tend to be heavily regulated and the effects of regulatory requirements on value have to be considered.

In this chapter, we begin by considering what makes financial service firms unique and ways of dealing with the differences. We then look at how best we can adapt discounted cash flow models to value financial service firms and look at three alternatives – a traditional dividend discount model, a cash flow to equity discount model and an excess return model. With each, we look at a variety of examples from the financial services arena. We move on to look at how relative valuation works with financial service firms and what multiples may work best with these firms.

In the last part of the chapter, we examine a series of issues that, if not specific to, are accentuated in financial service firms ranging from the effect of changes in regulatory requirements on risk and value to how best to consider the quality of loan portfolios at banks.

Categories of financial service firms

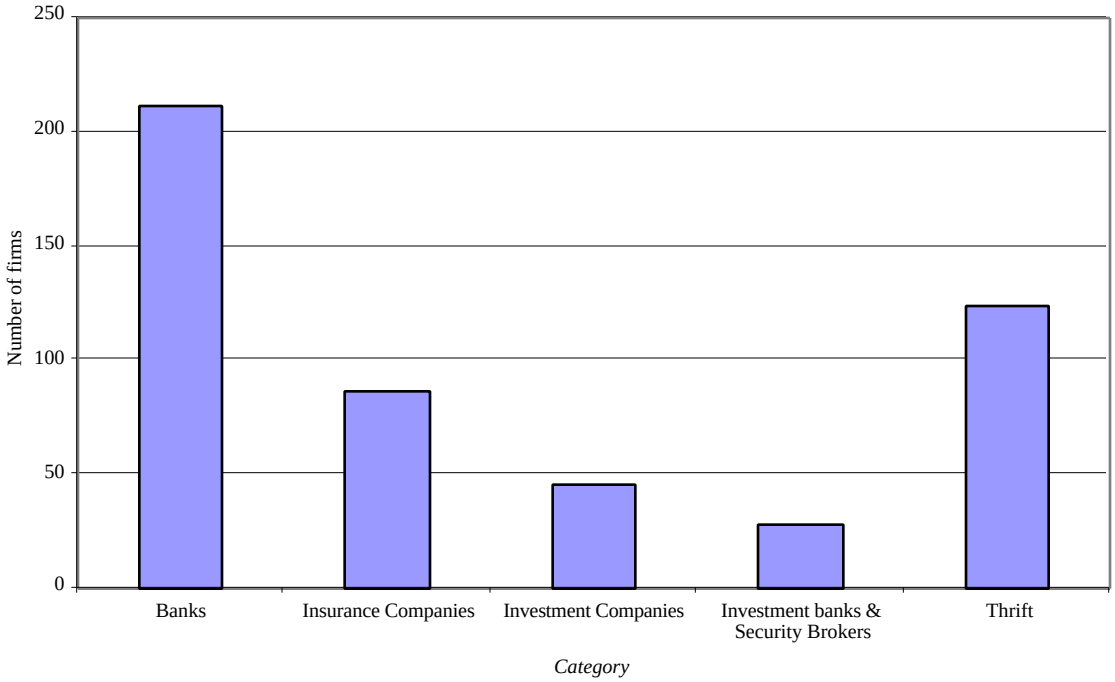
Any firm that provides financial products and services to individuals or other firms can be categorized as a financial service firm. We would categorize financial service businesses into four groups from the perspective of how they make their money. A *bank* makes money on the spread between the interest it pays to those from whom it raises funds and the interest it charges those who borrow from it, and from other services it offers it depositors and its lenders. *Insurance companies* make their income in two ways. One is through the premiums they receive from those who buy insurance protection from them and the other is income from the investment portfolios that they maintain to service the claims. An *investment bank* provides advice and supporting products for other firms to raise capital from financial markets or to consummate deals such as acquisitions or divestitures. *Investment firms* provide investment advice or manage portfolios for clients.

Their income comes from advisory fees for the advice and management and sales fees for investment portfolios.

With the consolidation in the financial services sector, an increasing number of firms operate in more than one of these businesses. For example, Citigroup, created by the merger of Travelers and Citicorp operates in all four businesses. At the same time, however, there remain a large number of small banks, boutique investment banks and specialized insurance firms that still derive the bulk of their income from one source.

How big is the financial services sector in the United States? Figure 21.1 summarizes the number of publicly traded banks, insurance companies, brokerage houses, investment firms and thrifts in the United States at the end of 2000.

Figure 21.1: Financial Service Firms



Even more striking than the sheer number of financial service firms is their diversity in terms of size and growth. Table 21.1 provides a measure of the range on each measure across different sectors.

Table 21.1: Cross Sectional Distribution: Financial Service Firms

	Market Value of Equity (in millions)	*Expected Growth Rate*

Industry	*Number of firms*	*Average*	*Maximum*	*Minimum*	*Standard Deviation*	*Average*	*Maximum*	*Minimum*	*Standard Deviation*
Banks	211	$4,836	$96,910	$10	$12,642	10.60%	19.00%	4.50%	2.82%
Insurance companies	86	$3,975	$90,317	$8	$11,663	11.24%	37.00%	1.50%	5.31%
Investment Companies	45	$476	$2,707	$9	$500	9.50%	14.50%	6.50%	3.35%
Securities Brokerage	27	$10,524	$97,987	$3	$23,672	17.56%	32.75%	10.00%	7.19%
Thrift	124	$707	$25,751	$5	$2,533	11.89%	38.33%	5.00%	5.00%

In emerging markets, financial service firms tend to have an even higher profile and account for a larger proportion of overall market value than they do in the United States. If we bring these firms into the mix, it is quite clear that no one template will value all financial service firms and that we have to be able to be flexible in how we design the model to allow for all types of financial service firms.

What is unique about financial service firms?

Financial service firms have much in common with non-financial service firms. They attempt to be as profitable as they can, have to worry about competition and want to grow rapidly over time. If they are publicly traded, they are judged by the total return they make for their stockholders, just as other firms are. In this section, though, we focus on those aspects of financial service firms that make them different from other firms and consider the implications for valuation.

Debt: Raw Material or Source of Capital

When we talk about capital for non-financial service firms, we tend to talk about both debt and equity. A firm raises funds from both equity investor and bondholders (and banks) and uses these funds to make its investments. When we value the firm, we value the value of the assets owned by the firm, rather than just the value of its equity.

With a financial service firm, debt seems to take on a different connotation. Rather than view debt as a source of capital, most financial service firms seem to view it as a raw

material. In other words, debt is to a bank what steel is to General Motors, something to be molded into other financial products which can then be sold at a higher price and yield a profit. Consequently, capital at financial service firms seems to be more narrowly defined as including only equity capital. This definition of capital is reinforced by the regulatory authorities who evaluate the equity capital ratios of banks and insurance firms.

The definition of what comprises debt also seems to be murkier with a financial service firm than it is with a non-financial service firm. For instance, should deposits made by customers into their checking accounts at a bank be treated as debt by that bank? Especially on interest-bearing checking accounts, there is little distinction between a deposit and debt issued by the bank. If we do categorize this as debt, the operating income for a bank should be measured prior to interest paid to depositors, which would be problematic since interest expenses are usually the biggest single expense item for a bank.

The Regulatory Overlay

Financial service firms are heavily regulated all over the world, though the extent of the regulation varies from country to country. In general, these regulations take three forms. First, banks and insurance companies are required to maintain capital ratios to ensure that they do not expand beyond their means and put their claimholders or depositors at risk. Second, financial service firms are often constrained in terms of where they can invest their funds. For instance, until recently, the Glass-Steagall act in the United States restricted commercial banks from investment banking activities and from taking active equity positions in manufacturing firms. Third, entry of new firms into the business is often restricted by the regulatory authorities, as are mergers between existing firms.

Why does this matter? From a valuation perspective, assumptions about growth are linked to assumptions about reinvestment. With financial service firms, these assumptions have to be scrutinized to ensure that they pass regulatory constraints. There might also be implications for how we measure risk at financial service firms. If regulatory restrictions are changing or are expected to change, it adds a layer of uncertainty (risk) to the future, which can have an effect on value.

Reinvestment at Financial Service Firms

In the last section, we noted that financial service firms are often constrained by regulation in both where they invest their funds and how much they invest. If, as we have so far in this book, define reinvestment as necessary for future growth, there are other problems associated with measuring reinvestment with financial service firms. Note that in Chapter 10, we consider two items in reinvestment – net capital expenditures and working capital. Unfortunately, measuring either of these items at a financial service firm can be problematic.

Consider net capital expenditures first. Unlike manufacturing firms that invest in plant, equipment and other fixed assets, financial service firms invest primarily in intangible assets such as brand name and human capital. Consequently, their investments for future growth often are categorized as operating expenses in accounting statements. Not surprisingly, the statement of cash flows to a bank show little or no capital expenditures and correspondingly low depreciation. With working capital, we run into a different problem. If we define working capital as the different between current assets and current liabilities, a large proportion of a bank's balance sheet would fall into one or the other of these categories. Changes in this number can be both large and volatile and may have no relationship to reinvestment for future growth.

As a result of this difficulty in measuring reinvestment, we run into two practical problems in valuing these firms. The first is that we cannot estimate cash flows without estimating reinvestment. In other words, if we cannot identify net capital expenditures and changes in working capital, we cannot identify cash flows either. The second is that estimating expected future growth becomes more difficult, if the reinvestment rate cannot be measured.

General Framework for Valuation

Given the unique role of debt at financial service firms, the regulatory restrictions that they operate under and the difficulty of identifying reinvestment at these firms, how can we value these firms? In this section, we suggest some broad rules that can allow us to deal with these issues. First, it makes far more sense to value equity directly at financial service firms, rather than the entire firm. Second, we either need a measure of cashflow

that does not require us to estimate reinvestment needs or we need to redefine reinvestment to make it more meaningful for a financial service firm.

Equity versus Firm

Early in this book, we noted the distinction between valuing a firm and valuing the equity in the firm. We value firms by discounting expected after tax cash flows prior to debt payments at the weighted average cost of capital. We value equity by discounting cash flows to equity investors at the cost of equity.

Estimating cash flows prior to debt payments or a weighted average cost of capital is problematic when debt and debt payments cannot be easily identified, which, as we argued earlier, is the case with financial service firms. Equity can be valued directly, however, by discounting cashflows to equity at the cost of equity. Consequently, we would argue for the latter approach for financial service firms. We would extend this argument to multiples as well. Equity multiples such as price to earnings or price to book ratios are a much better fit for financial service firms than value multiples such as value to EBITDA.

Estimating Cash Flows

To value the equity in a firm, we normally estimate the free cashflow to equity. In Chapter 10, we defined the free cash flow to equity.

Free Cashflow to Equity = Net Income – Net Capital Expenditures – Change in non-cash working capital – (Debt repaid – New debt issued)

If we cannot estimate the net capital expenditures or non-cash working capital, we clearly cannot estimate the free cashflow to equity. Since this is the case with financial service firms, we have two choices. The first is to use dividends as cash flows to equity and assume that firms over time pay out their free cash flows to equity as dividends. Since dividends are observable, we therefore do not have to confront the question of how much firms reinvest. The second is to adapt the free cashflow to equity measure to allow for the types of reinvestment that financial service firms make. For instance, given that banks operate under a capital ratio constraint, it can be argued that these firms have to reinvest equity capital in order to make more loans in the future.

Discounted Cashflow Valuation

In a discounted cash flow model, we consider the value of an asset to be the present value of the expected cash flows generated by that asset. In this section, we will first consider the use of dividend discount models to value banks and other financial service firms, then move on to analyze cashflow to equity models and conclude with an examination of excess return models.

Dividend Discount Models

In Chapter 13, we considered how to value the equity in a firm based upon dividend discount models. Using the argument that the only cash flows that a stockholder in a publicly traded firm receives are dividends, we valued equity as the present value of the expected dividends. We looked at the range of dividend discount models, ranging from stable to high growth, and considered how best to estimate the inputs. While much of what was said in that chapter applies here as well, we will consider some of the unique aspects of financial service firms in this section.

Basic Models

In the basic dividend discount model, the value of a stock is the present value of the expected dividends on that stock. Assuming that equity in a publicly traded firm has an infinite life, we arrive at:

$$\text{Value per share of equity} = \sum_{t=1}^{t=\infty} \frac{DPS_t}{(1+k_e)^t}$$

where

DPS_t = Expected dividend per share in period t

k_e = Cost of equity

In the special case where the expected growth rate in dividends is constant forever, this model collapses into the Gordon Growth model.

$$\text{Value per share of equity in stable growth} = \frac{DPS_1}{(k_e - g)}$$

where g is the expected growth rate in perpetuity. In the more general case, where dividends are growing at a rate which is not expected to be sustainable or constant forever during a period (called the extraordinary growth period), we can still assume that the

growth rate will be constant forever at some point in the future. This allows us to then estimate the value of a stock, in the dividend discount model, as the sum of the present values of the dividends over the extraordinary growth period and the present value of the terminal price, which itself is estimated using the Gordon growth model.

$$\text{Value per share of equity in extraordinary growth} = \sum_{t=1}^{t=n} \frac{DPS_t}{(1+k_{e,hg})^t} + \frac{DPS_{n+1}}{(k_{e,st}-g_n)(1+k_{e,hg})^n}$$

The extraordinary growth is expected to last n years, g_n is the expected growth rate after n years and k_e is the cost of equity (hg: high growth period and st: stable growth period).

Inputs to Model

In this section, we will focus purely on the estimation issues relating to financial service firms when it comes to the inputs to these models. In general, to value a stock using the dividend discount model, we need estimates of the cost of equity, the expected payout ratios and the expected growth rate in earnings per share over time.

a. Cost of Equity

In keeping with the way we have estimated the cost of equity for firms so far in this book, the cost of equity for a financial service firm has to reflect the portion of the risk in the equity that cannot be diversified away by the marginal investor in the stock. This risk is estimated using a beta (in the capital asset pricing model) or betas (in a multi-factor or arbitrage pricing model).

In our earlier discussions of betas, we argued against the use of regression betas because of the noise in the estimates (standard errors) and the possibility that the firm has changed over the period of the regression. How relevant are these arguments with financial service firms? The regression beta estimates of large and more mature financial service firms often are far more precise than the estimates for firms in other sectors. If regulatory restrictions have remained unchanged over the period and are not expected to change in the future, this may be one of the few sectors where regression betas can continue to be used with some confidence. In periods where the rules are changing and regulatory environments are shifting, the caveat about not using regression betas continues to hold.

There is a second area of difference. When estimating betas for non-financial service firms, we emphasized the importance of unlevering betas (whether they be

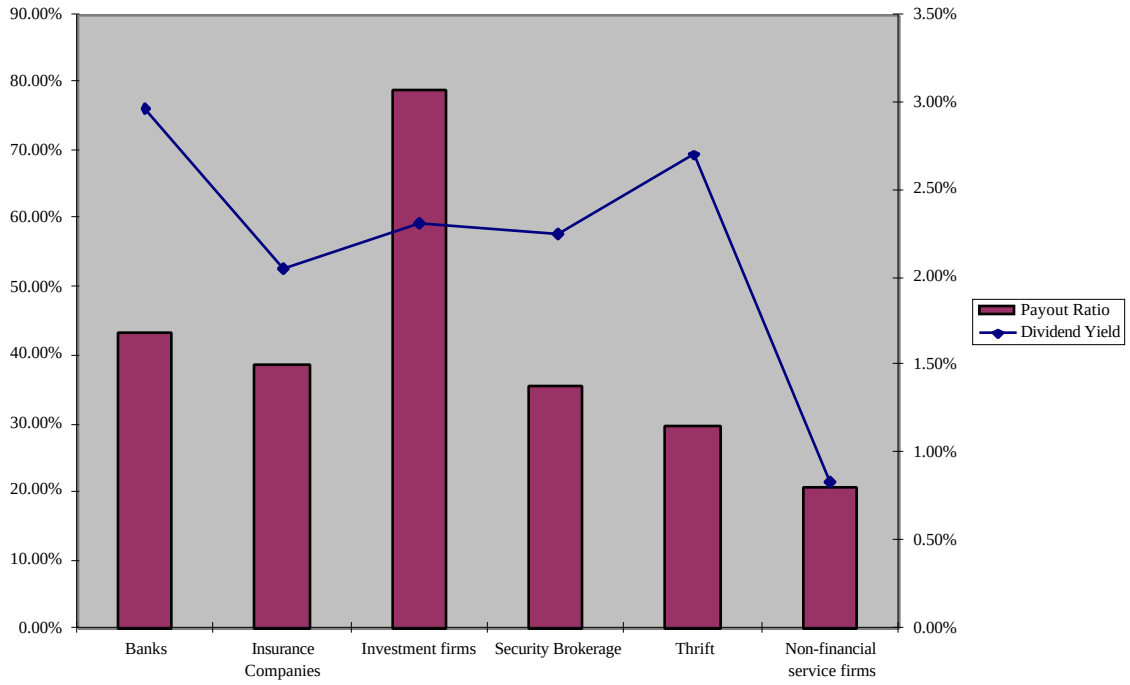
historical or sector averages) and then relevering them, using a firm's current debt to equity ratio. With financial service firms, we would skip this step for two reasons. First, financial service firms tend to be much more homogeneous in terms of capital structure – they tend to have similar financial leverage primarily due to regulations. Second, and this is a point made earlier, debt is difficult to measure for financial service firms. In practical terms, this will mean that we will use the average levered beta for comparable firms as the bottom-up beta for the firm being analyzed.

b. Payout Ratios

The expected dividend per share in a future period can be written as the product of the expected earnings per share in that period and the expected payout ratio. There are two advantages of deriving dividends from expected earnings. The first is that it allows us to focus on expected growth in earnings, which is both more reasonable and more accessible than growth in dividends. The second is that the payout ratio can be changed over time, to reflect changes in growth and investment opportunities.

The payout ratio for a bank, as it is for any other firm, is the dividend divided by the earnings. This said, financial service firms have conventionally paid out more in dividends than other firms in the market, as is clear from Figure 21.2.

Figure 21.2: Payout Ratios and Yields: Financial versus Non-financal service firms



The dividend payout ratios and dividend yields for banks, insurance companies, investment banks and investment firms are much higher than similar statistics for the rest of the market.

Why do financial service firms pay out more in dividends than other firms? An obvious response would be that they operate in much more mature businesses than firms in sectors such as telecommunications and software, but this is only part of the story. Even if we control for differences in expected growth rates, financial service firms pay out far more in dividends than other firms for two reasons. One is that banks and insurance companies need to invest far less in capital expenditures, at least as defined by accountants, than other firms. This, in turn, means that far more of the net income of these firms can be paid out as dividends than for a manufacturing firm. A second factor is history. Banks and insurance companies have developed a reputation as reliable payers of high dividends. Over time, they have attracted investors who like dividends, making it difficult for them to change dividend policy.

In recent years, in keeping with a trend that is visible in other sectors as well, financial service firms have increased stock buybacks as a way of returning cash to stockholders. In this context, focusing purely on dividends paid can provide a misleading

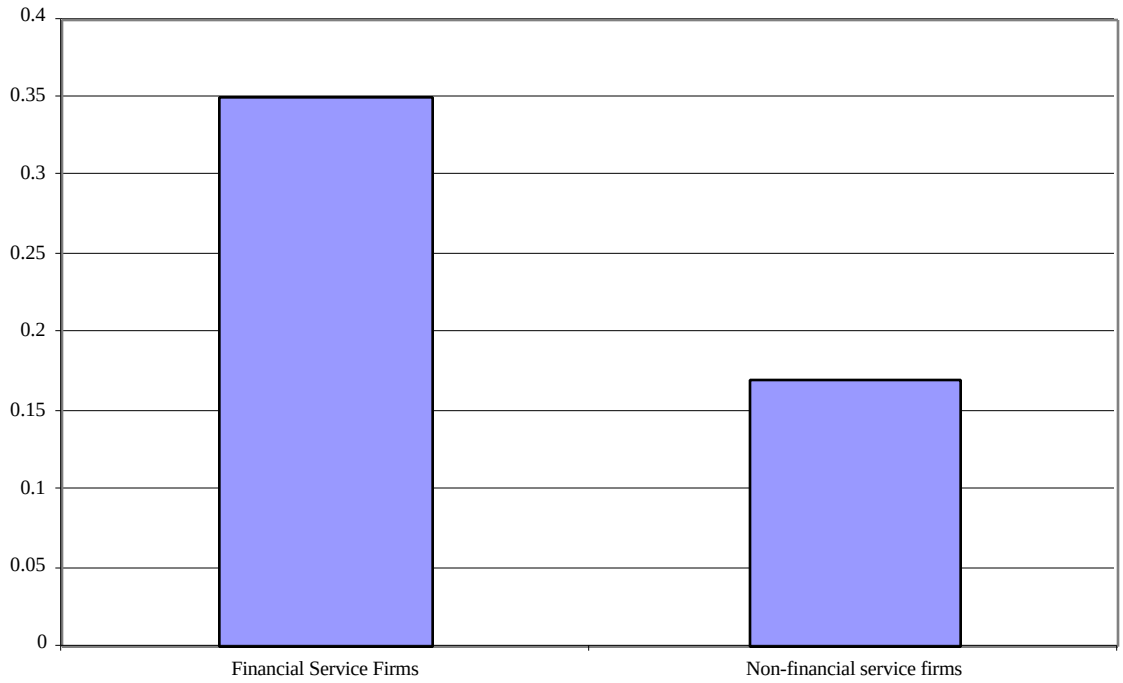
picture of the cash returned to stockholders. An obvious solution is to add the stock buybacks each year to the dividends paid and to compute the composite payout ratio. If we do so, however, we should look at the number over several years, since stock buybacks vary widely across time – a buyback of billions in one year may be followed by three years of relatively meager buybacks, for instance.

c. Expected Growth

If dividends are based upon earnings, the expected growth rate that will determine value is the expected growth rate in earnings. For financial service firms, as with other firms, earnings growth can be estimated in one of three ways.

- *Historical growth in earnings*: Many banks and insurance companies have very long histories and estimating historical growth is usually feasible. Furthermore, the correlation between past earnings growth and expected future growth is much higher for financial service firms than it is for other firms.

Figure 21.3: Correlation between past and expected growth



Note, in this figure, that the correlation between earnings growth over five-year periods is 0.35 for financial service firms, while it is only 0.17 for other firms.

This would suggest that historical growth in earnings is a much better predictor of future earnings at these firms. If the regulatory environment is changing, however, we have to be cautious about projecting past growth into the future.

- *Analyst Estimates in Growth in Earnings*: Analysts estimate expected growth rates in earnings for many publicly traded firms, though the extent of coverage varies widely. Many large banks and insurance companies are widely followed, allowing us to get these estimates of future growth. As noted in Chapter 11, it is an open question as to whether the long term forecasts from analysts are any better than historical growth for estimating future growth.
- *Fundamental Growth*: In Chapter 11, we suggested that the expected growth in earnings per share can be written as a function of the retention ratio and the return on equity.

Expected Growth in EPS = Retention ratio * Return on equity

This equation allows us to estimate the expected growth rate for firms with stable returns on equity. If we consider stock buybacks in addition to dividends when looking at payout, the retention ratio should be defined consistently as well.

If the return on equity is expected to change over time, the expected growth rate in earnings per share can be written as:

$$\text{Expected Growth}_{EPS} = (\text{Retention Ratio})(ROE_{t+1}) + \frac{ROE_{t+1} - ROE_t}{ROE_t}$$

In both formulations, the expected growth rate is a function of the retention ratio, which measures the quantity of reinvestment, and the return on equity, which measures their quality. How well do fundamental growth models work for financial service firms? Surprisingly well. The retention ratio in a bank measures the equity reinvested back into the firms, which in turn, given the regulatory focus on capital ratios, determines, in large part, how much these firms can expand in the future. The return on equity is also a more meaningful measure of investment quality because financial assets are much more likely to be marked up to market.

d. Stable Growth

To get closure with dividend discount models, we have to assume that the financial service firms that we are valuing will be in stable growth at some point in the future, where stable growth is defined to be growth that is less than or equal to the growth rate of the economy. In some cases, especially with larger firms in more mature businesses, the expected growth rate today may already be a stable growth rate.

In making the judgment of when a financial service firm will become a stable growth firm, we have to consider three factors. The first is the size of the firm, relative to the market that it serves. Larger financial service firms will find it more difficult to sustain high growth for long periods, especially in mature markets. The second is the nature of the competition. If competition is intense, stable growth will arrive sooner rather than later. If competition is restricted, high growth and excess returns can last for much longer. Finally, the way in which financial service firms are regulated can affect the convergence to stable growth, since regulation can operate both as a help and a hindrance. By restricting new entrants, regulations may help financial service firms maintain high growth for long. At the same time, though, regulatory restrictions may prevent firms from entering new and potentially lucrative businesses, which can reduce the length of the high growth period.

As noted in prior chapters, it is not only the growth rate that changes in stable growth. The payout ratio has to adjust to reflect the stable growth rate, and can be estimated from the payout ratio

$$\text{Payout ratio in stable growth} = 1 - \frac{g}{ROE_{\text{stable growth}}}$$

The risk of the firm should also adjust to reflect the stable growth assumption. In particular, if betas are used to estimate the cost of equity, they should converge towards one in stable growth.

Illustration 21.1: Stable Growth Dividend Discount Model – Citigroup

Citigroup, created by the merger of Citicorp and Travelers Group, is one of the giants in the financial service business. In 1999, Citigroup paid out dividends of $1,973 million on net income of $9,867 million; the return on equity for the year was 22%. The

low payout ratio and high return on equity would normally lead us to allow for a period of high growth for the firm but there are two other factors to consider.

- Citigroup bought back $4.3 billion of its own stock in 1999 and $4.1 billion in 1998. If we consider the sum of dividends and stock buybacks over both periods as a percent of net income, we arrive at a modified dividend payout ratio.

  Modified dividend payout ratio

  $$= \frac{\text{Buybacks}_{1998} + \text{Buybacks}_{1999} + \text{Dividends}_{1998} + \text{Dividends}_{1999}}{\text{Net Income}_{1998} + \text{Net Income}_{1999}}$$

  = (4125+4294+1846+1973)/(5807+9867)

  = 78.07%

  If we go back over the last 4 years, rather then just the last 2 years, the modified payout ratio is 56.40%. Over the same period, the return on equity at the firm has averaged out to 17%.

- Citigroup has a significant market share in almost every business that it competes it. While overall market growth may be high in some segments – emerging market investment banking, for instance – the firm faces strong competition in each of these segments.

With these factors in mind, we will assume that Citigroup is in stable growth and that its current earnings (estimated for 2000) of $13.993 billion will grow 5% in perpetuity. In addition, we will assume that the payout ratio looking forward will be 56.40% (the average modified payout ratio over last 4 years) and that the beta for the stock based upon its business mix is 1.00. With these inputs, a riskfree rate of 5.1% and a risk premium of 4%, we would value Citigroup as follows:

Cost of equity for Citigroup = 5.1% + 1.00 (4%) = 9.1%

$$\text{Value of Citigroup's equity} = \frac{\$13.993(1.05)(0.564)}{0.091 - 0.05} = \$202.113 \text{ billion}$$

There is an alternative approach we could have used to value Citigroup. Given its return on equity of 17%, we could have estimated a dividend payout ratio and used this ratio to value the stock.

$$\text{Estimated Dividend payout ratio} = 1 - \frac{g}{ROE} = 1 - \frac{0.05}{0.17} = 70.59\%$$

$$\text{Value of Citigroup's equity} = \frac{\$13.993(1.05)(0.7059)}{0.091 - 0.05} = \$253 \text{ billion}$$

Which is the more reasonable value? It depends upon whether we believe that the 17% return on equity that Citigroup earned between 1996 and 1999 can be maintained in perpetuity. If the answer is yes, the $253 billion value estimate is the better one. If, on the other hand, we assume that Citigroup's return on equity will decline over time, the initial estimate of $202 billion is more credible. At the time of this valuation in January 2001, Citicorp's market value of equity was $ 256 billion.

Illustration 21.2: A High Growth Dividend Discount Model – State Bank of India

Valuation as of: January 2001 *Stock price at time of valuation*: Rs 235

State Bank of India is India's largest bank, created in the aftermath of a nationalization of all banks in India in 1971. For the two decades that followed, it operated as a monopoly and was entirely government owned. In the 1990s, the Indian governments privatized portions of the bank while retaining control of its management and operations.

In 1999, State Bank of India earned 205 million Indian rupees on a book value of equity of 1,042 million rupees (at the beginning of 1999), resulting in a return on equity of 19.72%. The bank also paid out dividends of Rs 2.50 per share from earnings per share of Rs. 38.98; this yields a payout ratio of 6.41%. The high retention ratio suggests that the firm is investing substantial amounts in the expectation of high growth in the future. We will analyze its value over three phases – an initial period of sustained high growth, a transition period where growth drops towards stable growth and a stable growth phase.

High Growth Phase

If State Bank can maintain the current return on equity of 19.72% and payout ratio of 6.41%, the expected growth rate in earnings per share will be 18.46%.

Expected Growth rate = ROE * Retention ratio = 19.72% (1-0.0641) = 18.46%

The key question is how long the bank can sustain this growth. Given the large potential size of the Indian market, we assume that this growth will continue for 4 years. During this period, we also allow for the fact that there will be substantial risk associated with the Indian economy by allowing for a country risk premium in estimating the cost of

equity. Using the approach developed earlier in the book, we estimate a risk premium for India based upon its rating of BB+ and the relative equity market volatility of the Indian market.

Country risk premium for India

$= (\text{Country default spread})(\text{Relative equity market volatility})$

$= (3.00\%)(2.1433)$

$= 6.43\%$

To estimate the cost of equity during the high growth period – the next 4 years – we estimate the average beta for Asian commercial banks of 0.80 and assume that State Bank of India will have a similar beta. In conjunction with the riskfree rate in Indian rupees of 12.00%, we estimate a cost of equity of 20.34%.

Cost of Equity = Riskfree rate + Beta (Mature market premium + Country risk premium)

= 12.00% + 0.80 (4.00% + 6.43%) = 20.34%

With these estimates of expected growth, payout ratio and the cost of equity, we can estimate the present value of expected dividends per share over the next 4 years in Table 21.2.

Table 21.2: Estimated Dividends – High Growth Period

	1	*2*	*3*	*4*
Expected Growth Rate	18.46%	18.46%	18.46%	18.46%
Earnings per share	Rs46.17	Rs54.70	Rs64.79	Rs76.75
Payout ratio	6.41%	6.41%	6.41%	6.41%
Dividends per share	2.96	3.51	4.16	4.92
Cost of Equity	20.34%	20.34%	20.34%	20.34%
Present Value	Rs2.46	Rs2.42	Rs2.38	Rs2.35

Transition Phase

We expect State Bank to continue growing beyond year 4 but at a declining rate. Each year, we reduce the expected growth rate linearly from 18.46% to a stable growth rate of 10.00% - these growth rates are all in nominal rupees. As the growth rate declines, we allow the return on equity to decline (as competition increases) to 18% and the

payout ratio to rise to reflect the lesser need for reinvestment[1]. To illustrate, the payout ratio in year 8, when the expected growth rate is 10% can be computed.

$$\text{Payout ratio in year 8} = 1 - \frac{\text{Expected growth rate}}{\text{ROE}} = 1 - \frac{0.10}{0.18} = 0.4444 \text{ or } 44.44\%$$

We also adjust the country risk premium down from 6.43% to 3.00% to reflect our expectation that there will be less risk in investing in India as the country's economy matures. Table 21.3 summarizes expected dividends during the transition phase.

Table 21.3: Expected Dividends per share – Transition Phase

	5	*6*	*7*	*8*
Expected Growth Rate	16.34%	14.23%	12.11%	10.00%
Earnings per share	Rs89.29	Rs102.00	Rs114.35	Rs125.79
Payout ratio	15.92%	25.43%	34.94%	44.44%
Dividends per share	14.22	25.94	39.95	55.91
Cost of Equity	19.66%	18.97%	18.29%	17.60%
Cumulative Cost of Equity	250.98%	298.60%	353.20%	415.36%
Present Value	Rs5.66	Rs8.69	Rs11.31	Rs13.46

Note that the cost of equity in year 8 reflects the lower country risk premium.

Cost of equity in year 8 = 12.00% + 0.80 (4.00% + 3.00%) = 17.60%

The beta and the mature market risk premium of 4% have been left unchanged. To compute the present values of the expected dividends over the transition period, we compound the cost of equity and discount the cash flows at the compounded cost[2].

Stable Growth

In stable growth, we assume that State Bank's earnings and dividends will grow in perpetuity at 10% a year and discount them at the stable period cost of equity of

[1] The adjustment in the payout ratio is linear. The current payout ratio is 6.41% and the stable period payout ratio is 44.44%. Dividing the difference of 38.03% over four years yields an increase in the payout ratio of 9.51% each year.

[2] When the cost of equity changes each year, as it does between years 5 and 8, the compounded cost of equity has to be computed. For instance, the cashflow in year 6 will be discounted back using the following compounded cost:

Compounded cost = $(1.2034)^4$ (1.1966) (1.1897) = 2.9860

17.60%. The present value of these dividends in perpetuity, which yield the terminal price per share, can be computed to be:

$$= \frac{(\text{Expected Earnings per share}_9)(\text{Payout}_9)}{\text{Cost of equity - g}}$$

$$\text{Terminal price per share} = \frac{125.79(1.10)(0.4444)}{0.176 - 0.10}$$

$$= \text{Rs } 809.18$$

Final Valuation

The final value per share for State Bank can be computed by adding the present values of the dividends during the high growth phase, the dividends during the transition period and the terminal price at the end of the transition period.

Value per share

= PV of dividends: high growth + PV of dividends: transition phase + PV of terminal price

$$= 2.46 + 2.42 + 2.38 + 2.35 + 5.66 + 8.69 + 11.31 + 13.46 + \frac{809.18}{4.1536}$$

= Rs 243.55

Note that the terminal price is discounted back at the compounded cost of equity for the 8^{th} year.

Valuing a Non-dividend Paying Financial Service Firm

While many financial service firms do pay dividends, a large number of young, high growth financial service firms in recent years have chosen not to pay dividends and reinvest all of their earning back into their operations. In fact, some of these firms lose money. While it may seem inappropriate to use the dividend discount model to value such firms, we will argue that the model is flexible enough to deal with them. How, if dividends are zero, will we ever be able to get a positive value for a share? The answer is simple, at least for firms that have positive earnings currently. While dividends are zero currently and are expected to be zero for the foreseeable future, when the firm is growing, the growth will ultimately subside. As the growth drops, the firm's capacity to pay out dividends will increase. In fact, using the fundamental equation for growth from the last section, we can estimate the expected payout ratio in future periods.

$$\text{Expected Payout ratio} = 1 - \frac{g}{ROE}$$

The equity will derive its value from expected future dividends.

If earnings are negative currently, the mechanics become a little more involved. We first have to estimate earnings in future periods. Presumably, we would expect earnings to become positive some period in the future. (If we did not, the value of equity would be zero and the valuation exercise would be unnecessary.) Once earnings become positive, the rest of the analysis resembles what we did above.

Illustration 21.3: Valuing a Non-dividend Paying Financial Service Firm – NetBank

Valuation as of: January 2001 *Stock Price*: $ 9.50

NetBank is a virtual bank that offers banking services to customers. At the time of this valuation, the bank had just made the turn to profitability and reported net income of $3.05 million on a beginning book value of equity of $38.76 million; this amounted to earnings per share of $0.246. The bank paid no dividends but we anticipate significant growth in earnings both from growth in deposits and economies of scale (which should improve the return on equity). The expected growth rate in earnings is 30% for the next 6 years and it is then expected to decline linearly to a stable growth rate of 5% in the 12th year.

NetBank is not expected to pay dividends during the first 6 years of high growth. During this period, the bank is also exposed to significant risk. We use a beta of 1.70 to reflect the risk of e-commerce ventures and estimate a cost of equity of 11.80%, based upon a treasury bond rate of 5% and a risk premium of 4%.

Cost of equity = 5% + 1.70 (4%) = 11.80%

Table 21.4 summarizes the expected earnings during this high growth period.

Table 21.4: Expected Earnings and Dividends during high growth phase

	1	*2*	*3*	*4*	*5*	*6*
Expected Growth Rate	30.00%	30.00%	30.00%	30.00%	30.00%	30.00%
Earnings per share	$0.32	$0.42	$0.54	$0.70	$0.91	$1.19
Payout ratio	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
Dividends per share	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00

Cost of Equity	11.80%	11.80%	11.80%	11.80%	11.80%	11.80%
Present Value	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00

In stable growth (after the 12th year), the bank is expected to earn a return on equity of 12% which will allow it to pay out 58.33% of its earnings as dividends during the period:

$$\text{Expected dividend payout ratio in 12}^{\text{th}}\text{ year} = 1 - \frac{g}{ROE} = 1 - \frac{5\%}{18\%} = 58.33\%$$

Between years 6 and 12, as the growth rate tapers off, we will assume that the payout ratio will increase from 0% to 58.33% in linear increments. We will also assume that the risk in the equity will also decline, with the beta dropping from 1.70 to 1.00 in stable growth. Table 21.5 summarizes the expected earnings and dividends during this transition period.

Table 21.5: Expected Earnings and Dividends during transition phase

	7	*8*	*9*	*10*	*11*	*12*
Expected Growth Rate	25.83%	21.67%	17.50%	13.33%	9.17%	5.00%
Earnings per share	$1.49	$1.82	$2.14	$2.42	$2.64	$2.77
Payout ratio	9.72%	19.44%	29.17%	38.89%	48.61%	58.33%
Dividends per share	$0.15	$0.35	$0.62	$0.94	$1.28	$1.62
Cost of Equity	11.33%	10.87%	10.40%	9.93%	9.47%	9.00%
Cumulative Cost of Equity	217.41%	241.03%	266.10%	292.53%	320.23%	349.05%
Present Value	$0.07	$0.15	$0.23	$0.32	$0.40	$0.46

The dividends begin in year 6 and grow at a much faster rate than earnings because the payout ratio increases.

The terminal price at the end of the 12th year can be estimated using the dividends in year 13, the stable period cost of equity and the expected growth rate in perpetuity.

$$\text{Terminal price per share} = \frac{EPS_{12}(1+g_{stable})(\text{Payout ratio}_{13})}{\text{Cost of equity}_{13} - g_{stable}}$$

$$= \frac{(2.77)(1.05)(0.5833)}{0.09 - 0.05}$$

$$= \$42.49$$

The value per share today can then be computed as the sum of the present values of the dividends during high growth and the present value of the terminal price:

$$\text{Value per share} = \$0.07 + \$0.15 + \$0.23 + \$0.32 + \$0.40 + \$0.46 + \frac{\$42.49}{3.4905} = \$13.81$$

The terminal price per share is discounted at the compounded cost of equity of 3.4905 in year 12.

Cashflow to Equity Models

At the beginning of this discussion, we noted the difficulty in estimating cashflows when net capital expenditures and non-cash working capital cannot be easily identified. It is possible, however, to estimate cashflows to equity even for financial service firms if we define reinvestment differently.

Defining Cashflow to Equity

The cashflow to equity is the cashflow left over for equity investors after debt payments have been made and reinvestment needs met. With financial service firms, the reinvestment generally does not take the form of plant, equipment or other fixed assets. Instead, the investment is in human capital and regulatory capital; the latter is the capital as defined by the regulatory authorities, which, in turn, determines the limits on future growth. There are ways in which we could incorporate both of these items into the reinvestment.

Capitalize Training and Employee Development Expenses

If human capital is a large factor in determining the success or failure of a financial service firm, we could capitalize the expenses associated with developing this capital. The process for doing so closely mirrors the process for capitalizing research and development expenses for technology firms and involves the following steps.

1. *Identify the amortizable life for the asset*: To determine the period over which these expenses will be written off, we have to begin with how long a typical employee that the firm has invested its resources in stays with the firm.
2. *Collect information on employee expenses in prior years*: The amount spent by the firm on employee training and development in prior years is collected,

with the number of years matching the amortizable life specified in the first step.

3. *Compute the current year's amortization expense*: The expenses in each of the prior years is amortized. With a linear amortization schedule, the expense will be spread equally over the amortizable life. The sum total of the amortization of all of the expenses in previous years will become the current year's amortization expense.
4. *Adjust the net income for the firm*: The net income for the firm is adjusted for the capitalization of employee expenses.

   Adjusted Net Income = Reported Net income + Employee development expense in the current year – Amortization of the employee expenses (from step 3)
5. *Compute the value of the human capital*: The value of human capital in the firm can be computed by adding up the unamortized portion of the employee development expenses in each of the prior years.

Employee development expenses are more difficult to capitalize than research and development expenses for two reasons. The first is that while research expenses are usually consolidated and reported as one item on a financial statement, employee development expenses tend to be widely spread across the firm and may be included in several different items in an income statement. Disentangling these expenses from employee salary and benefits may be difficult to do. The second is that the patents and licenses that emerge from research belong to the firm and often give it exclusive rights in commercial use. A firm's employees, on the other hand, are mobile and may, and often do, move to competitors who offer them better terms.

Assuming that we can get over these practical difficulties in valuing human capital, let us consider the factors that determine the value that human capital adds to a firm. The first is the *employee turnover ratio*; as this ratio rises, the amortizable life for employee expenses will fall and with it the value of human capital. The second relates to the *resources spent* by the firm in employee development and training; the greater the resources, the greater the value assigned to human capital. There is a third and often ignored factor. If we consider human capital as an asset, it is the *excess returns* that we

make on the asset that create value. To create excess returns, a firm will have to pay an employee less than what he or she generates in value to the firm. To illustrate, an investment bank will generate value from a bond trader that works for it only if it pays that trader less than what he or she generates in profits for the firm. Why might the trader settle for less? One reason might be that the investment bank has some unique capability that allows the trader to earn these profits; this unique capability might come from proprietary information, client lists or market position. Another reason might be non-economic; the trader may have enough goodwill towards the investment bank that he or she might be willing to give up higher compensation elsewhere. Firms that treat their employees well and are loyal to them in bad times are much likely to earn this goodwill and have higher value as a consequence.

Investments in Regulatory Capital

For a financial service firm that is regulated based upon capital ratios, equity earnings that are not paid out increase the equity capital of the firm and allow it to expand its activities. For instance, a bank that has a 5% equity capital ratio can make $100 in loans for every $5 in equity capital. When this bank reports net income of $15 million and pays out only $5 million, it is increasing its equity capital by $10 million. This, in turn, will allow it to make $200 million in additional loans and presumably increase its growth rate in future periods.

Using this argument, the portion of net income that does not get paid out can be viewed as reinvestment. It works, however, only if the firm takes advantage of its larger capital base and grows. If it does not, the equity retained is more akin to cash accumulating in the firm rather than reinvestment. One way to measure this usage is to look at the equity capital ratios of the firm over time and compare them to the regulatory constraints. A firm that reports an equity capital ratio that rises over time, well above the regulatory constraint, is not using its equity capital to grow.

Why Earnings are not cash flows?

There are some analysts who value banks by discounting their earnings back to the present. They make the argument that banks have little or no net capital expenditure

needs and that working capital needs– inventory, accounts receivable etc. – are non-existent. The problem, though, is that they couple the discounting of earnings with an expected growth rate in these earnings. This is clearly not feasible.

To see why, consider a bank that does pay out 100% of its earnings as dividends. If this firm issues no new equity, its book equity will stay frozen at current levels forever. If this bank continues to grow its loan portfolio, it will end up with capital ratios that are lower than the regulatory minimum sooner rather than latter.

That is why reinvestment has to include investments in regulatory capital, acquisitions and other such investments that banks need to make to continue to grow. That is also why even mature banks with low growth rates cannot afford to pay out 100% of their earnings as dividends.

Excess Return Models

The third approach to valuing financial service firms is to use an excess return model. In such a model, the value of a firm can be written as the sum of capital invested currently in the firm and the present value of dollar excess returns that the firm expects to make in the future. In this section, we will consider how this model can be applied to valuing equity in a bank.

Basic Model

Given the difficulty associated with defining total capital in a financial service firm, it makes far more sense to focus on just equity when using an excess return model to value a financial service firm. The value of equity in a firm can be written as the sum of the equity invested in a firm's current investments and the expected excess returns to equity investors from these and future investments.

Value of Equity = Equity Capital invested currently + Present Value of Expected Excess Returns to Equity investors

The most interesting aspect of this model is its focus on excess returns. A firm that invests its equity and earns just the fair-market rate of return on these investments should see the market value of its equity converge on the equity capital currently invested in it.

A firm that earns a below-market return on its equity investments will see its equity market value dip below the equity capital currently invested.

The other point that has to be emphasized is that this model considers expected future investments as well. Thus, it is up to the analyst using the model to forecast not only where the financial service firm will direct its future investments but also the returns it will make on those investments.

Inputs to Model

There are two inputs needed to value equity in the excess return model. The first is a measure of equity capital currently invested in the firm. The second and more difficult input is the expected excess returns to equity investors in future periods.

The equity capital invested currently in a firm is usually measured as the book value of equity in the firm. While the book value of equity is an accounting measure and is affected by accounting decisions, it should be a much more reliable measure of equity invested in a financial service firm than in a manufacturing firm for two reasons. The first is that the assets of a financial service firm are often financial assets that are marked up to market; the assets of manufacturing firms are real assets and deviations between book and market value are usually much larger. The second is that depreciation, which can be a big factor in determining book value for manufacturing firms, is often negligible at financial service firms. Notwithstanding this, the book value of equity can be affected by stock buybacks and extraordinary or one-time charges. The book value of equity for financial service firms that have one or both may understate the equity capital invested in the firm.

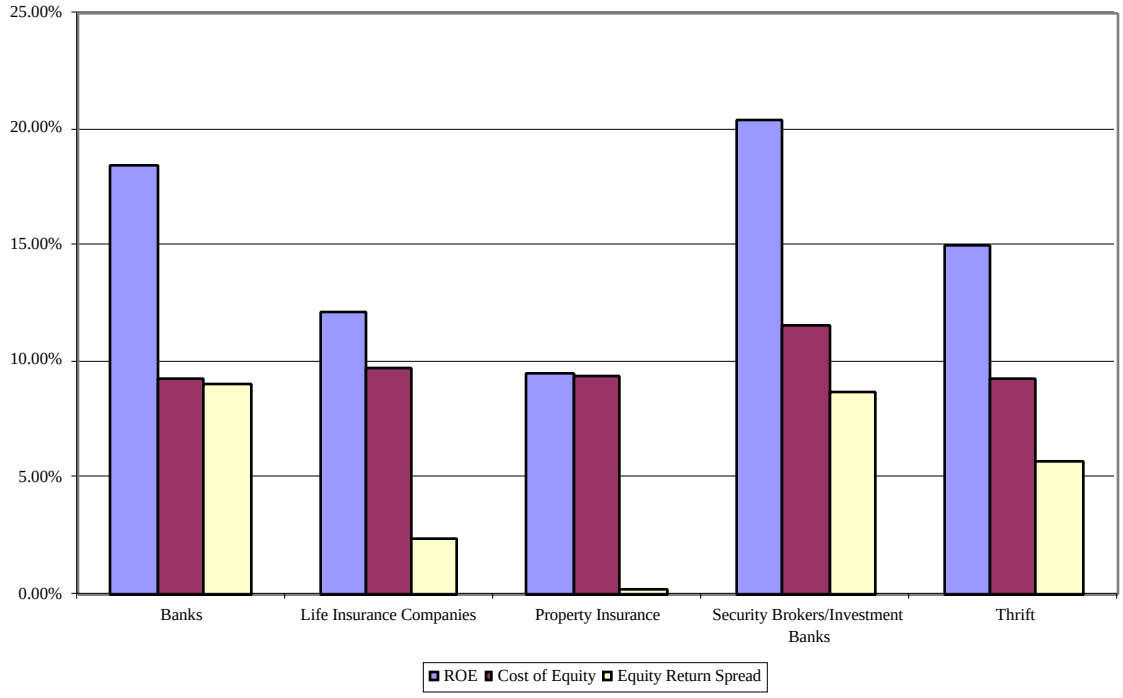
The excess returns, defined in equity terms, can be stated in terms of the return on equity and the cost of equity.

Excess Equity return = (Return on equity – Cost of equity) (Equity capital invested)

Here again, we are assuming that the return on equity is a good measure of the economic return earned on equity investments. When analyzing a financial service firm, we can obtain the return on equity from the current and past periods, but the return on equity that is required is the expected future return. This requires an analysis of the firm's strengths and weaknesses as well as the competition faced by the firm. Figure 21.4

summarizes the return on equity, cost of equity and equity return spread for financial service firms.

Figure 21.4: Return Spreads for Financial Service Firms



In making estimates of expected equity return spreads, we have to allow for the fact that the presence of large excess returns is likely to attract competition. These excess returns will fade over time and this should be reflected in the forecasts.

Illustration 21.4: Excess Return Valuation – Morgan Stanley Dean Witter

Morgan Stanley Dean Witter (MSDW) is one of the leading investment banks in the world. In 2000, the firm was earning a return on equity of 30.86% on its equity capital of $17.997 billion. Based upon comparable firms, we estimate the beta of the firm to be 1.15, which results in a cost of equity of 9.60% (with a treasury bond rate of 5% and a risk premium of 4%).

$$\text{Cost of equity} = 5\% + 1.15\ (4\%) = 9.60\%$$

We assume that the return on equity over the next 5 years will average 25%, reflecting the competitive pressures as MSDW expands globally, and that the cost of equity will be unchanged over that period. In addition, we assume that MSDW will maintain its existing

dividend payout ratio of 19.37%. The excess returns to equity investors are computed in the Table 21.6.

Table 21.6: Excess Returns – High Growth Period

	1	*2*	*3*	*4*	*5*
Net Income	$4,499.25	$5,406.20	$6,495.98	$7,805.43	$9,378.85
- Equity Cost (see below)	$1,727.71	$2,075.98	$2,494.46	$2,997.29	$3,601.48
Excess Equity Return	$2,771.54	$3,330.22	$4,001.52	$4,808.15	$5,777.37
Cumulated Cost of Equity	1.09600	1.20122	1.31653	1.44292	1.58144
Present Value	$2,528.78	$2,772.38	$3,039.44	$3,332.23	$3,653.23
Estimating Equity Cost Each year					
Beginning BV of Equity (see below)	$17,997.00	$21,624.82	$25,983.92	$31,221.74	$37,515.38
Cost of Equity	9.60%	9.60%	9.60%	9.60%	9.60%
Equity Cost	$1,727.71	$2,075.98	$2,494.46	$2,997.29	$3,601.48
Estimating Book Value of Equity					
Return on Equity	25.00%	25.00%	25.00%	25.00%	25.00%
Net Income	$4,499.25	$5,406.20	$6,495.98	$7,805.43	$9,378.85
Dividend Payout Ratio	19.37%	19.37%	19.37%	19.37%	19.37%
Dividends paid	$871.43	$1,047.10	$1,258.17	$1,511.79	$1,816.53
Retained Earnings	$3,627.82	$4,359.11	$5,237.81	$6,293.64	$7,562.31

The net income each year is computed by multiplying the return on equity each year by the beginning book value of equity. The book value of equity each year is augmented by the portion of earnings that is not paid out as dividends – the retained earnings. To put closure on this valuation, we have to make assumptions about excess returns after year 5. If we assume that excess returns are zero, the value of Morgan Stanley's equity would be the sum of the present values of the excess returns computed in Table 21.6 and the existing book value of equity.

We assumed that the net income would grow 5% a year beyond year 5, that the return on equity would drop to 15% and that the beta for the stock would decline to 1.10.

Net Income$_6$ = $9378.85 *1.05 = $9847.79

Cost of equity in stable growth period = 5% + 1.1 (4%) = 9.40%

$$\text{Book value of Equity at beginning of year 6} = \frac{\text{Net Income}_6}{\text{ROE}_6} = \frac{9847.79}{0.15} = \$65{,}651.92$$

Note that this book value of equity is significantly higher than the book value of equity in year 5 and reflects the much lower return on equity in stable growth[3]. The terminal value of excess returns to equity investors can then be computed.

$$\text{Terminal value of excess returns} = \frac{\text{Net Income}_6 - (\text{Cost of equity}_6)(\text{BV of Equity}_6)}{\text{Cost of equity - Expected growth rate}} = \frac{9{,}847.79 - (65{,}651.92)(0.094)}{0.094 - 0.05} = \$83{,}556.98$$

The value of equity can then be computed as the sum of the three components – the book value of equity invested today, the present value of excess equity returns over the next 5 years and the present value of the terminal value of equity.

Book value of Equity Invested currently	=$17,997.00	
PV of Equity Excess Return – next 5 years	=$15,326.06	
PV of terminal value of excess returns	=$52,836.01	{83,556.98/1.096^5}
Value of Equity	=$86,159.07	
Number of shares	=1120.713	
Value Per Share	=$76.88	

At the time of this valuation in January 2001, Morgan Stanley was trading at $ 75 a share.

Asset Based Valuation

In asset based valuation, we value the existing assets of a financial service firm, net out debt and other outstanding claims and report the difference as the value of equity. For example, with a bank, this would require valuing the loan portfolio of the bank (which would comprise its assets) and subtracting outstanding debt to estimate the value of

equity. For an insurance company, you would value the policies that the company has in force and subtract out the expected claims resulting from these policies and other debt outstanding to estimate the value of the equity in the firm.

How would you value the loan portfolio of a bank or the policies of an insurance company? One approach would be to estimate the price at which the loan portfolio can be sold to another financial service firm, but the better approach is to value it based upon the expected cash flows. Consider, for instance, a bank with a $1 billion loan portfolio with a weighted average maturity of 8 years, on which it earns interest income of $70 million. Furthermore, assume that the default risk on the loans is such that the fair market interest rate on the loans would be 6.50%; this fair market rate can be estimated by either getting the loan portfolio rated by a ratings agency or by measuring the potential for default risk in the portfolio. The value of the loans can be estimated.

$$\text{Value of loans} = \$\ 70 \text{ million (PV of annuity, 8 years, 6.5\%)} + \frac{\$1{,}000 \text{ million}}{1.065^8}$$

$$= \$\ 1{,}030 \text{ million}$$

This loan portfolio has a fair market value that exceeds its book value because the bank is charging an interest rate that exceeds the market rate. The reverse would be true if the bank charged an interest rate that is lower than the market rate. To value the equity in this book, you would subtract out the deposits, debt and other claims on the bank.

This approach has merit if you are valuing a mature bank or insurance company with little or no growth potential but it has two significant limitations. First, it does not assign any value to expected future growth and the excess returns that flow from that growth. A bank, for instance, that consistently is able to lend at rates higher than justified by default risk should be able to harvest value from future loans as well. Second, it is difficult to apply when a financial service firm enters multiple businesses. A firm like Citigroup that operates in multiple businesses would prove to be difficult to value because the assets in each business – insurance, commercial banking, investment banking,

[3] This is an adjustment that is needed to make the book value of equity consistent with our assumptions about a lower return on equity in stable growth. The alternative is to drop the net income in year 6 to 15% of the book value of equity at the beginning of year 6.

portfolio management – would need to be valued separately, with different income streams and different discount rates.

Relative Valuation

In our chapters on relative valuation, we examined a series of multiples that are used to value firms, ranging from earnings multiples to book value multiples to revenue multiples. In this section, we consider how relative valuation can be used for financial service firms.

Choices in Multiples

Firm value multiples such as Value to EBITDA or Value to EBIT cannot be easily adapted to value financial service firms, because neither value nor operating income can be easily estimated for banks or insurance companies. In keeping with our emphasis on equity valuation for financial service firms, the multiples that we will work with to analyze financial service firms are equity multiples. The three most widely used equity multiples are price earnings ratios, price to book value ratios and price to sales ratios. Since sales or revenues are not really measurable for financial service firms, price to sales ratios cannot be estimated or used for these firms. We will look, in this section, at the use of price earnings and price to book value ratios for valuing financial service firms.

Price Earnings Ratios

The price earnings ratio for a bank or insurance companies is measured much the same as it is for any other firm.

$$\text{Price Earnings Ratio} = \frac{\text{Price per share}}{\text{Earnings per share}}$$

In Chapter 18, we noted that the price earnings ratio is a function of three variables – the expected growth rate in earnings, the payout ratio and the cost of equity. As with other firms, the price earnings ratio should be higher for financial service firms with higher expected growth rates in earnings, higher payout ratios and lower costs of equity.

An issue that is specific to financial service firms is the use of provisions for expected expenses. For instance, banks routinely set aside provisions for bad loans. These provisions reduce the reported income and affect the reported price earnings ratio.

Consequently, banks that are more conservative about categorizing bad loans will report lower earnings and have higher price earnings ratios, whereas banks that are less conservative will report higher earnings and lower price earnings ratios.

Another consideration in the use of earnings multiples is the diversification of financial service firms into multiple businesses. The multiple that an investor is willing to pay for a dollar in earnings from commercial lending should be very different than the multiple that the same investor is will to pay for a dollar in earnings from trading. When a firm is in multiple businesses with different risk, growth and return characteristics, it is very difficult to find truly comparable firms and to compare the multiples of earnings paid across firms. In such a case, it makes far more sense to break the firm's earnings down by business and assess the value of each business separately.

Illustration 21.5: Comparing PE ratios: Insurance Companies

In Table 21.7, we compare the current price earnings ratios of life insurance companies in January 2001.

Table 21.7: PE Ratios and Expected Growth Rates – Life Insurance Companies

Company Name	*PE Ratio*	*Expected Growth Rate*	*Standard Deviation*
AEGON Ins. Group	32.96	11.50%	36.61%
AFLAC Inc.	34.53	19.00%	43.23%
AmerUs Group Co	12.76	10.00%	33.46%
Delphi Fin'l `A'	10.50	10.50%	39.72%
Great West Lifeco Inc.	22.00	15.00%	35.09%
Jefferson-Pilot Corp.	13.93	9.00%	30.49%
Lincoln Nat'l Corp.	13.01	9.50%	38.07%
Nationwide Financial	2.65	14.53%	42.84%
Penn Treaty	6.47	15.00%	43.18%

American			
Protective Life	12.36	12.00%	50.64%
Reinsurance Group	29.80	13.30%	50.79%
The MONY Group Inc.	6.22	9.50%	72.16%
Torchmark Corp.	13.53	9.50%	37.64%
U I C I	9.40	18.00%	63.38%
UNUMProvident Corp.	9.51	6.00%	56.42%

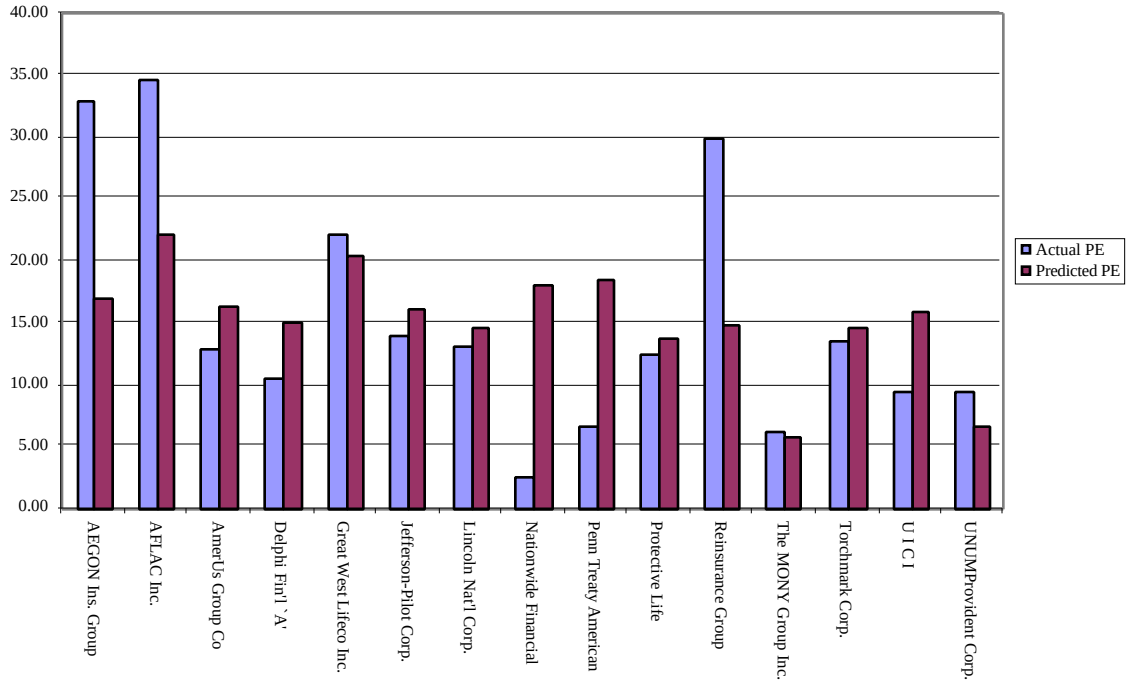
The PE ratios vary widely and range from 2.65 for Nationwide Financial to 34.53 for AFLAC. We also report the consensus estimates by analysts of the growth rate in earnings per share over the next 5 years and the standard deviation in stock prices over the previous five years. Some of the variation in PE ratios can be explained by differences in the expected growth rate – higher growth firms tend to have higher PE ratios - and some of it is due to differences in risk – more risky firms have lower PE ratios. Regressing PE ratios against the expected growth rate and the standard deviation yields the following:

PE Ratio = 15.72 + 91.67 Expected Growth Rate – 25.72 Standard deviation R^2=19%

(1.21) (1.28) (-1.17)

While the regression has limited explanatory power and the coefficients are of marginal statistical significance, it confirms the intuition that higher growth and lower risk firms have higher PE ratios than other firms. Figure 21.5 uses this regression to estimate predicted PE ratios for the companies in the table and reports on whether the firms are under or over valued.

Figure 21.5: Actual versus Predicted PE Ratios



Based upon this regression, Reinsurance Group looks significantly overvalued while Penn Treaty and Nationwide Financial look significantly undervalued.

Illustration 21.6: Earnings Multiples for Business: Citigroup

Citigroup is in multiple businesses – commercial banking, investment banking and asset management. In Table 21.8, we summarize the income that Citigroup earned from each business in 2000.

Table 21.8: Citigroup – Business Valuations

Business	*Net Income*	*PE Ratio for Business*	*Estimated Value of Equity*
Investment Banking	$5,800	21.44	$124,352
Commercial Banking	$5,200	15.61	$81,172
Asset Management	$500	28.7	$14,350
Entire firm	$11,500		$219,874

The value of each business is estimated using the average price earnings multiple of other firms that operate only in that business.

This approach can be generalized to allow the multiples of earnings used in each business to reflect the differences between that business and other firms that operate only in that business. For instance, if Citigroup's asset management business has higher growth and lower risk than other asset management firms, you would use a higher earnings multiple for the income from the business.

Price to Book Value Ratios

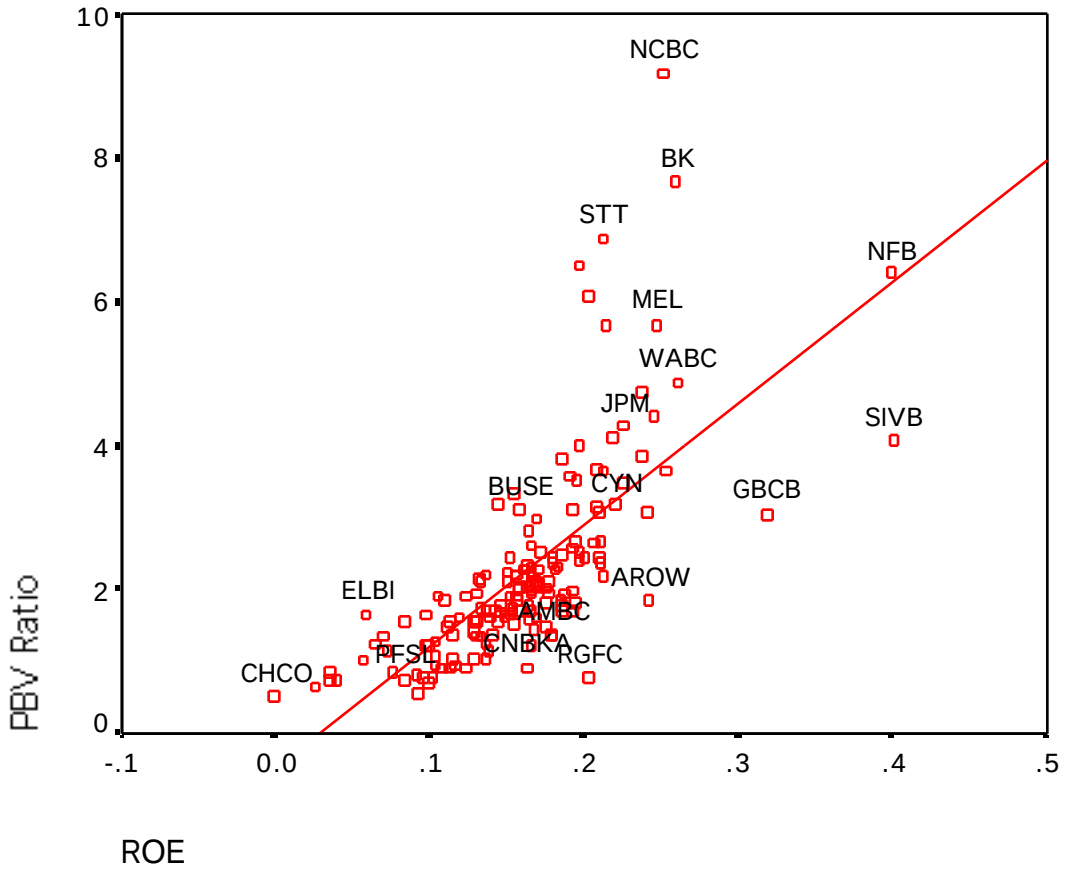
The price to book value ratio for a financial service firm is the ratio of the price per share to the book value of equity per share.

$$\text{Price to Book Ratio} = \frac{\text{Price per share}}{\text{Book value of equity per share}}$$

This definition is identical to the one presented in Chapter 19 and it is determined by the variables specified in that chapter – the expected growth rate in earnings per share, the dividend payout ratio, the cost of equity and the return on equity. Other thing remaining equal, higher growth rates in earnings, higher payout ratios, lower costs of equity and higher returns on equity should all result in higher price to book ratios. Of these four variable, the return on equity has the biggest impact on the price to book ratio, leading us to identify it as the companion variable for the ratio.

If anything, the strength of the relationship between price to book ratios and returns on equity should be stronger for financial service firms than for other firms, because the book value of equity is much more likely to track the market value of equity invested in existing assets. Similarly, the return on equity is less likely to be affected by accounting decisions. The strength of the relationship between price to book ratios and returns on equity can be seen when we plot the two on a scatter plot for commercial banks in the United States in Figure 21.6.

Figure 21.6: Price to Book Ratios and Returns on Equity: Banks



Banks such as North Fork Bancorp (NFB) and WestAmerica Bancorp (WABC) that have high price to book value ratios tend to have high returns on equity. Banks such as City Holding (CHCO) and Eldorado Bancshares (ELBI) that have low returns on equity tend to have low price to book value ratios. The correlation between price to book ratios and returns on equity is 0.70.

While emphasizing the relationship between price to book ratios and returns on equity, we should not ignore the other fundamentals. For instance, banks vary in terms of risk, and we would expect for any given return on equity that riskier banks should have lower price to book value ratios. Similarly, banks with much greater potential for growth should have much higher price to book ratios, for any given level of the other fundamentals.

Illustration 21.7: Price to Book Value Ratios: Investment Banks

In Table 21.9, we report the price to book ratios and returns on equity for security brokerage houses and investment banks.

Table 21.9: Price to Book Ratios and Returns on Equity: Investment Banks & Brokers

Company Name	*Ticker Symbol*	*Market Cap*	*PBV Ratio*	*ROE*
Advest Group	ADV	$283.00	2.09	15.25%
Annaly Mortgage Mgmt	NLY	$141.40	1.37	16.26%
Bear Stearns	BSC	$6,056.50	1.46	20.92%
Brantley Capital	BBDC	$31.40	0.60	7.44%
Dain Rauscher	DRC	$1,237.60	3.17	23.27%
DLJdirect Com	DIR	$86.30	0.37	0.35%
Edwards (A.G.)	AGE	$3,843.20	2.24	21.98%
Fahnestock Viner 'A'	FVH	$272.10	1.45	22.15%
Firebrand Finl Group Inc	FFGI	$3.40	0.13	9.26%
Goldman Sachs	GS	$52,108.60	5.14	32.04%
H. D. Vest Inc	HDVS	$29.80	2.76	27.78%
Jefferies Group	JEF	$683.50	1.72	14.02%
Kirlin Hldg Corp	KILN	$12.10	0.68	-6.21%
Legg Mason	LM	$3,287.30	4.37	21.36%
Lehman Bros. Holdings	LEH	$18,771.30	3.36	31.72%
M H Meyerson & Co Inc	MHMY	$19.30	0.93	14.98%
Merrill Lynch & Co.	MER	$58,235.50	4.71	35.81%
Morgan Keegan Inc.	MOR	$762.30	2.95	18.29%
Morgan S. Dean Witter	MWD	$97,986.70	6.15	34.22%
Olympic Cascade Finl	OLY	$8.40	1.05	20.00%

Paulson Capital	PLCC	$16.40	0.65	47.24%
Raymond James Fin'l	RJF	$1,811.00	3.24	24.33%
Schwab (Charles)	SCH	$37,823.80	16.63	34.21%
Southwest Secs Group	SWS	$442.90	1.52	34.32%
Stifel Finanical Corp.	SF	$79.10	1.34	16.75%

While the relationship between price to book ratios and returns on equity is weaker for this sample than it is for commercial banks, higher price to book value ratios tend to go with higher returns on equity. Regressing the price to book ratios against the return on equity yields the following:

Price to Book Ratio = 0.1314 + 12.41 (Return on Equity) R^2 = 20%

(0.11) (2.40)

Using this regression yields predicted price to book ratios for any firm in the same. For instance, the predicted price to book ratio for Merrill Lynch would be:

Predicted price to book ratio for Merrill Lynch = 0.1314 + 12.41 (0.3581) = 4.58

With an actual price to book ratio of 4.71, Merrill is close to fairly priced.

Issues in Valuing Financial Service Firms

Up till this point in this chapter, we have emphasized the similarities between financial service firms and other firms. In this section, we will consider some of the special issues that arise in the context of valuing financial service firms and how best to incorporate them into the value.

Provisions for Losses

Banks and insurance companies often set aside provisions to meet future losses. These provisions reduce net income in the current period but are used to meet expected losses in future periods. Thus, a provision for bad debts reduces a bank's income in the current period but allows the bank to cover bad debts when they do occur. In general, while the actual bad debts that occur in any year will not match the provision set aside for that year exactly, the cumulative provisions over time should be equal to the cumulated bad debts over the same period. If this is the case, the provisions smooth out earnings

over time, making them lower than the true earnings in years when the economy does well – when default rates are lower – and higher than true earnings in years when the economy does badly –when default rates are higher.

There can be a problem, however, when firms consistently set aside more or less in provisions than they expect to lose. If they set aside too much, the net income will be understated which will also lower the return on equity and the retention ratio. If expected growth is the product of these two, the value of equity in the firm will be reduced. If too little is set aside, the net income will be overstated (at least for the moment) and you could over estimate the value of equity. The quickest fix for this problem is to look at the provisions set aside over time and the actual losses over time. If the numbers do not match, the provision should be reestimated, based upon the actual loss ratio and the net income should be restated. To illustrate, if a bank sets aside 8% of its loans into a reserve for bad debts, when its actual bad debt ratio is only 4%, the net income should be recomputed using a 4% provision for bad debts. This will increase the net income, the return on equity and the equity value of the bank. The reverse will be true if too little is set aside.

Regulatory Risk and Value

As we have noted in this chapter, financial service firms are much more likely to be regulated. This regulation can affect the perceived risk of investing in these firms as well as the expected cash flows. Consequently, they should affect the value of these firms. When valuing financial service firms using discounted cash flow models, the regulatory effects can be built explicitly into both the discount rate as well as the expected future cash flows.

- To incorporate regulatory risk into the discount rate, we first need to decide whether such risk is diversifiable in a portfolio. For the most part, we would argue that regulatory risk is diversifiable and should not affect the discount rate. In exceptional cases, where financial service firms dominate a market and the regulatory risk is large, the cost of equity will include a premium for this risk.
- It is the cashflows, in our view, where regulatory concerns have the biggest impact. The expected growth rate, which was derived from the retention ratio and

the return on equity, will be affected by regulatory restrictions on where financial service firms can invest. If the restrictions on investments are severe, for instance, financial service firms may be destined to earn low returns on equity for the foreseeable future, which will negatively affect their values.

If we use relative valuation models and are comparing financial service firms that operate under different regulatory regimes, either because they are from different countries (European banks versus U.S. banks) or are in different businesses (investment banks versus commercial banks), the multiples may vary across firms because of the regulatory differences.

Financing Mix and Value

When analyzing manufacturing firms, we looked at the effect of changing the mix of debt and equity used by the firm for funding on value. With financial service firms, we generally do not examine the financing mix question for two reasons. One is the afore-mentioned difficulty of defining and measuring debt. The other is that financial service firms tend to use as much debt as they can afford to carry, making it very unlikely that they will be significantly underlevered or overlevered.

There is the danger, though, that arises from regulatory considerations driving the choice of financial mix. Regulatory requirements are often based upon book values of debt and equity and may not always be rational. For instance, if the regulatory capital ratios are set too low for risky loan portfolios, banks that meet regulatory requirements may be borrowing too much. Conversely, banks that do not use their debt capacity will be worth less than banks that do. However, if the inability to use debt capacity is engrained in the regulations that cover banks, there is little that can be done to use it.

Subsidies and Constraints

In many markets, banks and insurance companies operate under systems where they derive special benefits because of subsidies and exclusive rights that they are granted, while at the same time being forced to make investments at below-market rates in what are viewed as socially desirable investments. Both subsidies and social investments affect value and can be incorporated into cash flows.

The best approach to bringing in the effect of subsidies into the value is to project the expected positive excess returns or cash flows that will be generated as a consequence of the subsidy or exclusive right and to separate this excess return from the rest of the valuation. The same process can be repeated with social investments, though the effect will usually be negative. The present value of the negative excess returns can be computed and netted from the value of the firm.

There are two advantages in separating the subsidy benefit value and the social investment cost from the rest of the valuation. The first is that it allows us to make specific assumptions that apply only to these items. For instance, the subsidy that the government grants may be expected to last only ten years and be guaranteed, in which case, we would compute the value of the subsidy using ten years of expected cash flows and the riskfree rate as the discount rate. The second is that it allows firms to determine whether the tradeoff is a favorable one for value, since the social investment requirements are often tied to the subsidy grants. In other words, a bank that is provided a subsidy by the government in return for providing below-market interest rate loans to small businesses may find that the loss in value associated with the latter exceeds the subsidy benefits.

Illustration 21.8: Valuing Subsidies and Social Investment

Consider the valuation of the State Bank of India in Illustration 21.2. Over the last three decades, the State Bank has been given both special privileges (exclusive entry in some markets) and unique responsibilities (such as lending to high-risk businesses at below-market rates). The value of the bank is enhanced by the first and reduced by the latter and the effect on value of each can be computed. Consider for instance, the effect of exclusivity in some businesses. By itself, this will allow the bank to earn excess returns in these businesses and the value added will be the present value of these excess returns. On the other side of the coin, the requirement that the bank lend at below market rates results in a loss in value that come computed as the present value of the negative excess returns in these markets.

Assume, for example, that State Bank is given the exclusive right to lend money to other Indian government enterprises and that the bank uses the exclusivity to charge 1%

more than the market interest rate that would be charged these enterprises in a competitive environment. If the bank has 1 billion rupees in loans outstanding to these enterprises and the fair market interest rate for these enterprises is 10%, the present value of the excess returns in perpetuity can be computed.

$$\text{Present value of above-market rate loans} = \frac{(0.01)(1000)}{0.10} = 100 \text{ million rupees}$$

If the exclusivity is expected not to be perpetual, but disappear after 10 years, the present value of the excess returns will be lower and can be computed as the present value of an annuity over 10 years.

A similar value can be attached to the requirement that the bank lend at below market rates. For instance, if State Bank is required to loan 800 million rupees to small farmers at 8%, when a fair market interest rate for such loans would be 14%, the effect on value of this requirement can be computed.

$$\text{Value effect of below market loans} = \frac{(800 \text{ million})(0.08 - 0.14)}{0.14} = -343 \text{ million rupees}$$

While this value is computed on the assumption that the below market rates will continue in perpetuity, the analysis can also be modified to allow for shorter periods.

Deposit Insurance and Bank Value

In most countries, the state provides insurance to bank depositors by guaranteeing the deposits up to a specified limit. What effect will such deposit insurance have on value? If banks are charged a fair price for the insurance, it should have no effect on value. In practice, though, deposit insurance can skew value in two ways.

- In many countries, including the U.S, the deposit insurance rate does not vary across banks. Thus, banks with safe loan portfolios are charged the same rate as banks with risky loan portfolios. If the rate set is based upon average default, this will result in the former being over charged and the latter being under charged. It will also create an incentive system for banks to take on more and more risk. In fact, you can consider deposit insurance to be a put option provided to the bank – the bank can put its deposit liabilities to the insurance agency if the value of its loan portfolio drops below the value of the liabilities. If the put price does not vary with the volatility in the

value of the loan portfolio, banks with riskier portfolios will become more valuable (the value of the put will exceed the price paid) and banks with safer portfolios will become less valuable.

- Even if deposit insurance rates vary across banks, the price of the insurance may not fully reflect the risk of the bank's assets for two reasons. The first is that the risk can change from period to period and the pricing may not keep up. The second is that the insurance may be subsidized by taxpayers, in which case all banks will become more valuable as a result of the insurance.

Conclusion

The basic principles of valuation apply just as much for financial service firms as they do for other firms. There are, however, a few aspects relating to financial service firms that can affect how they are valued. The first is that debt, for a financial service firm, is difficult to define and measure, making it difficult to estimate firm value or costs of capital. Consequently, it is far easier to value the equity directly in a financial service firm, by discounting cash flows to equity at the cost of equity. The second is that capital expenditures and working capital, which are required inputs to estimating cash flows, are often not easily estimated at financial service firms. In fact, much of the reinvestment that occurs at these firms is categorized under operating expenses. To estimate cashflows to equity, therefore, we either have to use dividends (and assume that what is not paid out as dividend is the reinvestment) or modify our definition of reinvestment.

Even if we choose to use multiples, we run into many of the same issues. The difficulties associated with defining debt make equity multiples such as price earnings or price to book value ratios better suited for comparing financial service firms than value multiples. In making these comparisons, we have to control for differences in fundamentals – risk, growth, cash flows, loan quality – that affect value.

Finally, regulatory considerations and constraints overlay financial firm valuations. In some cases, regulatory restrictions on competition allow financial service firms to earn excess returns and increase value. In other case, the same regulatory authorities may restrict the potential excess returns that a firm may be able to make by preventing the firm from entering a business.

Problems

1. You have been asked to assess the value per share of Secure Savings, a mature savings and loan company. The company had earnings per share in the just-completed financial year of $4.00 per share and paid dividends of $2.40 per share. The book value of equity at the beginning of the year was $40 per share. The beta for the stock is 0.90, the riskfree rate is 6% and the market risk premium is 4%.
   a. Assuming that the firm will continue to earn its current return on equity in perpetuity and maintain its current dividend payout ratio, estimate the value per share.
   b. If the stock is trading at $40 a share, estimate the implied growth rate.

2. You are now valuing the Southwest Bank, a small bank that is growing rapidly. The bank reported earnings per share of $2.00 in the just-completed financial year and paid out dividends per share of $0.20. The book value of equity at the beginning of the year was $14.00. The beta for the stock is 1.10, the riskfree rate is 6% and the risk premium is 4%.
   a. Assuming that it will maintain its current return on equity and payout ratio for the next 5 years, estimate the expected growth rate in earnings per share.
   b. Assuming that the firm will start growing at a constant rate of 5% a year beyond that point in time, estimate the value per share today. (You can assume that the return on equity will drop to 12% in stable growth and that the beta will become 1.)

3. You have been asked to analyze LongLife Insurance company, a firm in stable growth, with earnings expected to grow 4% in the long term. The firm is trading at a multiple of 1.4 times book value and has a cost of equity of 11%.
   a. If the market is pricing the stock correctly, estimate the return on equity that LongLife is expected to earn in perpetuity.
   b. If the regulatory authorities constrain LongLife to earn a return on equity equal to its cost of equity, what would you expect the price to book ratio to be?

4. Now assume that you are comparing the price to book ratios of the 13 largest banks in the United States in 2000. The following table summarizes the price to book ratios and the returns on equity earned by these firms.

Company Name	*P/BV*	*ROE*
Wachovia Corp.	2.05	18.47%
PNC Financial Serv.	2.54	21.56%
SunTrust Banks	1.91	15.35%
State Street Corp.	6.63	19.52%
Mellon Financial Corp.	4.59	23.95%
Morgan (J.P.) & Co	1.74	19.39%
First Union Corp.	1.52	19.66%
FleetBoston Fin'l	2.25	20.15%
Bank of New York	7.01	25.36%
Chase Manhattan Corp.	2.60	24.60%
Wells Fargo	3.07	17.72%
Bank of America	1.69	19.31%
Bank of Montreal	1.23	18.08%

   a. If you were valuing SunTrust Banks, relative to these firms, would you expect it to have a higher or lower price to book ratio than the average for the group? Explain why.
   b. If you regress price to book ratios against returns on equity, what would your predicted price to book ratios be for each of these companies?

5. Signet Bank has asked you to estimate the value of their loan portfolio. The bank has $1 billion in loans outstanding, with an average maturity of 6 years, and expected interest income of $75 million a year. You have been able to get a synthetic rating of A for the entire loan portfolio and the current market interest rate on A rated bonds is 6.5%.
   a. Estimate the value of the loan portfolio.

b. If Signet bank has $800 million in debt outstanding, estimate the value of the equity in the bank based upon the loans it has in place.