Valuing Financial Service Firms

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Valuing banks, insurance companies and investment banks has always been difficult, but the market crisis of 2008 has elevated the concern to the top of the list of valuation issues. The problems with valuing financial service firm stem from two key characteristics. The first is that the cash flows to a financial service firm cannot be easily estimated, since items like capital expenditures, working capital and debt are not clearly defined. The second is that most financial service firms operate under a regulatory framework that governs how they are capitalized, where they invest and how fast they can grow. Changes in the regulatory environment can create large shifts in value. In this paper, we confront both factors. We argue that financial service firms are best valued using equity valuation models, rather than enterprise valuation models, and with actual or potential dividends, rather than free cash flow to equity. The two key numbers that drive value are the cost of equity, which will be a function of the risk that emanates from the firm's investments, and the return on equity, which is determined both by the company's business choices as well as regulatory restrictions. We also look at how relative valuation can be adapted, when used to value financial service firms.

Banks, insurance companies and other financial service firms pose special challenges for an analyst attempting to value them, for three 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 second is that they tend to be heavily regulated and changes in regulatory requirements can have significant effect on value. The third is that the accounting rules that govern bank accounting have historically been very different from the accounting rules for other firms, with assets being marked to market more frequently for financial service firms.

In this paper, we begin by considering what makes financial service firms unique and ways of dealing with the differences. We move on to look at how the dark side of valuation manifests itself in the valuation of financial service firms in the form of an unhealthy dependence on book values, earnings and dividends. We then look at how best we can adapt discounted cash flow models to value financial service firms by looking 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 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.

Financial Service firms – The Big Picture

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? We would not be exaggerating if we said that the development of the economy in the US would not have occurred without banks providing much of the capital for growth, and that insurance companies predate both equity and bond markets as pioneers in risk sharing. Financial service firms have been the foundation of the US economy for decades and the results can be seen in many measures. Table 14.1 summarizes the market capitalization of publicly traded banks, insurance companies, brokerage houses, investment firms and thrifts in the United States at the end of 2007 and the proportion of the overall equity market that they represented at the time.

*Table 14.1: Financial Service firms – Market Capitalizations on January 1, 2008 (in millions)*

Sector	Number	Market Cap	Proportion of market
Banks	550	$2,404,664	4.78%
Financial Services	294	$1,153,793	2.29%
Insurance	353	$4,029,009	8.00%
Securities Brokerage	31	$731,343	1.45%
Thrift	234	$156,596	0.31%
All financial service	*1462*	*$8,475,404*	*16.83%*

At the start of 2008, financial service firms accounted for about a sixth of the overall market, in terms of market capitalization. In addition, the financial services sector, in the 2002 economic census, accounted for 6% of all full time employees in the United States.

Given the importance of financial service companies to the economy, the crisis of 2008 acted as a wake up call for investors on two fronts. As stock prices at established financial service firms like AIG, Citigroup and Bank of America collapsed, the fragility of the system came to the fore. At the same time, the failure of the banking system also made us more aware of how dependent the entire economy is on the health of financial service firms. Without banks lending money, investment banks backing acquisition and financing deals, and insurance companies pooling risk, the rest of the real economy came

to a standstill. By the end of 2008, financial service firms had seen huge declines in their market capitalizations, but given the pull they exercised on the rest of the market, they preserved their proportional standing, for the most part (as seen in figure 14.1):

Figure 14.1: Financial Service firms as proportion of market - January '08- January '09
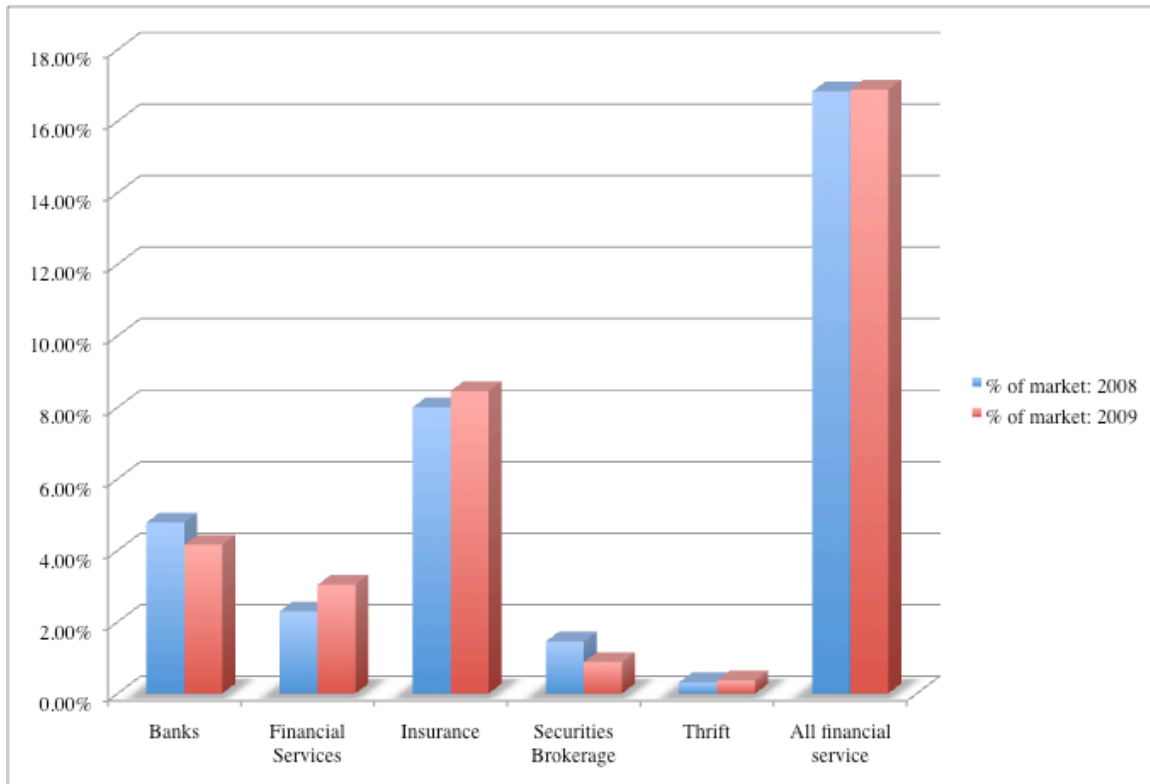
In fact, while banking and security brokerage have declined as a proportion of the overall market, the other financial sectors have increased their share, leaving the total share almost unchanged after a year of unprecedented volatility.

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 flexible in how we valuation models to allow for all types of financial service firms.

Characteristics of financial service firms

There are many dimensions on which financial service firms differ from other firms in the market. In this section, we will focus on four key differences and look at why these differences can create estimation issues in valuation. The first is that many

categories (albeit not all) of financial service firms <u>operate under strict regulatory constraints</u> on how they run their businesses and how much capital they need to set aside to keep operating. The second is that accounting rules for recording earnings and asset value at financial service firms <u>are at variance with accounting rules for the rest of the market</u>. The third is that debt for a financial service firm is more akin to raw material than to a source of capital; the notion of cost of capital and enterprise value may be meaningless as a consequence. The final factor is that the <u>defining reinvestment</u> (net capital expenditures and working capital) for a bank or insurance company may be not just difficult, but impossible, and cash flows cannot be computed.

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 regulatory capital ratios, computed based upon the book value of equity and their operations, 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 a decade ago, the Glass-Steagall Act in the United States restricted commercial banks from investment banking activities as well as from taking active equity positions in non-financial service firms. Third, the entry of new firms into the business is often controlled 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. Put more simply, to value banks, insurance companies and investment banks, we have to be aware of the regulatory structure that governs them.

Differences in Accounting Rules

The accounting rules used to measure earnings and record book value are different for financial service firms than the rest of the market, for two reasons. The first is that the assets of financial service firms tend to be financial instruments (bonds, securitized obligations) that often have an active market place. Not surprisingly, marking assets to market value has been an established practice in financial service firms, well before other firms even started talking about fair value accounting. The second is that the nature of operations for a financial service firm is such that long periods of profitability are interspersed with short periods of large losses; accounting standard have been developed to counter this tendency and create smoother earnings.

a. Mark to Market: If the new trend in accounting is towards recording assets at fair value (rather than original costs), financial service firms operate as a laboratory for this experiment. After all, accounting rules for banks, insurance companies and investment banks have required that assets be recorded at fair value for more than a decade, based upon the argument that most of a bank's assets are traded, have market prices and therefore do not require too many subjective judgments. In general, the assets of banks and insurance companies tend to be securities, many of which are publicly traded. Since the market price is observable for many of these investments, accounting rules have tilted towards using market value (actual of estimated) for these assets. To the extent that some or a significant portion of the assets of a financial service firms are marked to market, and the assets of most non-financial service firms are not, we fact two problems. The first is in comparing ratios based upon book value (both market to book ratios like price to book and accounting ratios like return on equity) across financial and non-financial service firms. The second is in interpreting these ratios, once computed. While the return on equity for a non-financial service firm can be considered a measure of return earned on equity invested originally in assets, the same cannot be said about return on equity at financial service firms, where the book equity measures not what was originally invested in assets but an updated market value.

b. Loss Provisions and smoothing out earnings: Consider a bank that makes money the old fashioned way – by taking in funds from depositors and lending these funds out to

individuals and corporations at higher rates. While the rate charged to lenders will be higher than that promised to depositors, the risk that the bank faces is that lenders may default, and the rate at which they default will vary widely over time – low during good economic times and high during economic downturns. Rather than write off the bad loans, as they occur, banks usually create provisions for losses that average out losses over time and charge this amount against earnings every year. Though this practice is logical, there is a catch, insofar as the bank is given the responsibility of making the loan loss assessment. A conservative bank will set aside more for loan losses, given a loan portfolio, than a more aggressive bank, and this will lead to the latter reporting higher profits during good times.

Debt and Equity

In the financial balance sheet that we used to describe firms, there are only two ways to raise funds to finance a business – debt and equity. While this is true for both all firms, financial service firms differ from non-financial service firms on three dimensions:

a. Debt is raw material, not 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 has 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 a manufacturing company, something to be molded into other products which can then be sold at a higher price and yield a profit. Consequently, capital at financial service firms seems to be 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.

b. Defining Debt: The definition of what comprises debt also is 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.

c. Degree of financial leverage: Even if we can define debt as a source of capital and can measure it precisely, there is a final dimension on which financial service firms differ from other firms. They tend to use more debt in funding their businesses and thus have higher financial leverage than most other firms. While there are good reasons that can be offered for why they have been able to do this historically - more predictable earnings and the regulatory framework are two that are commonly cited – there are consequences for valuation. Since equity is a sliver of the overall value of a financial service firm, small changes in the value of the firm's assets can translate into big swings in equity value.

Estimating cash flows is difficult

We noted earlier that financial service firms are 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 problems associated with measuring reinvestment with financial service firms. Note that, 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 difference 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 how much a company is

reinvesting for future growth, we cannot identify cash flows either. The second is that estimating expected future growth becomes more difficult, if the reinvestment rate cannot be measured.

The Dark Side of Valuation

The factors that characterize financial service firms – assets that are marked to market, earnings that are after provisions for future losses and the difficulty we face in defining debt and reinvestment – all have an effect on how these firms are valued. In this section, we will consider some common pitfalls in valuing financial service firms.

Debt

For much of this book, we have adopted the standard practice of forecasting cash flows after taxes and reinvestment, but before debt payments, and discounting these cash flows back at a composite cost of capital. Adopting this practice with financial service firms can have disastrous consequences for several reasons, but one of the biggest is in the computation of the cost of capital. As we noted in the last section, defining debt in a bank or insurance company is a very difficult exercise. If we decide to treat all short term and long term borrowing as debt, the debt ratios we arrive at for banks will be stratospheric – after all, even deposits at bank branches meet many of the criteria for debt. If we combine these high debt ratios with the low costs of debt, we will end up with costs of capital that are unrealistically small – 4% or lower for many banks.

If we decide to go with a narrower definition of debt, we have to decide what to include in debt and what to exclude, with all of its subjective components. Thus, we can decide to include only long term debt in the cost of capital computation and end up with more reasonable looking numbers, but there is no logical rationale for the choice.

Cash flow substitutes

In the last section, we noted that our inability to identify and separate out capital expenditures and working capital investments in financial service firms makes it difficult, if not impossible, to estimate cash flows with any degree of precision. There are some analysts who plough on using either implausible variants on cash flows or use the conventional definition of cash flow, in spite of the limitations.

a. <u>Earnings as cash flows</u>: 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 a positive (or even high) 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 or later. 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.

b. <u>Pseudo cash flow</u>: If analysts stick with the conventional definition of cash flows as net of reinvestment and use the capital expenditure and working capital number that they compute for banks, they can generate measures of cash flows that are even more skewed than earnings. First, the net capital expenditures at a financial service firm, at least as defined by conventional accounting statements, will be a very small or negative number. Second, defining working capital as the difference between non-cash current assets and non-debt current liabilities can yield strange numbers, in any given year.

In effect, analysts who claim to use cash flows to value banks are using numbers that are not good measures of cash flows and end up with values that reflect them.

Go with the flow: Dividends

Many analysts accept the reality that estimating cash flows for financial service firms is not feasible and fall back on the only observable cash flow – dividends. While this makes sense, these analysts are implicitly assuming that the dividends that are paid out by a bank or insurance company are sustainable and reasonable. However, that does not always have to be true. We do know that some banks pay out less in dividends than they can and use the excess to pad their capital ratios, whereas other banks pay dividends

that are far too high and then try to compensate by issuing new shares. If we value the former, using actual dividends paid, we will under value them, since we will build in the current practice of paying too little into their cashflows in perpetuity. If we value the latter, using actual dividends paid, we will over value them.

The focus on current dividends can also create problems, when valuing financial service firms that have growth potential. If these firms hold back on paying larger dividends, given their needs to fund growth, the dividends paid will be lower than those paid by more mature firms; in some cases, there may be no dividends. If we use these dividends as our basis for valuation, and do not adjust the dividend payout as growth becomes lower, we will significantly under value firms. In the special case of firms that do not pay dividends, we will arrive at the result of a zero value for equity.

Illustration 14.1: Dividends and Growth: Wells Fargo

Wells Fargo paid out dividends per share of $1.30 in 2008, reflecting growth of about 4% a year from 2001 to 2008. If we allow for a cost of equity for banks of approximately 9% and assume that dividends will continue to growth at 4% a year forever, we can derive the value of equity per share from a stable growth dividend discount model:

$$\text{Value of equity per share} = \frac{\text{Expected dividends per share}_{\text{next year}}}{(\text{Cost of equity - Stable growth rate})} = \frac{1.30(1.04)}{(.09 - .04)} = \$27.04$$

Since the stock was trading at $15.75/share at the time of this analysis, this indicates a significantly under valued stock. However, there are reasons to be skeptical about the valuation:

a. The earnings per share dropped from $4.47 in 2007 to $1.71 in 2008, with the expectation that it would drop further to $1.34/share in 2009. In effect, we are assuming that the dividends will be higher than earnings in 2009.

b. The growth in dividends between 2001 to 2008 reflected the fact that Wells Fargo was going through a boom period, with net income increasing from $3.4 billion in 2001 to $8.1 billion in 2007. In 2008, net income dropped to $2.8 billion, reflecting deteriorating business conditions. It is likely that Wells Fargo will have to cut dividends to reflect the deterioration of earnings.

Using the current dividends per share and historical growth in dividends in these circumstances will yield too high a value of equity per share.

Trusting book value

There are two reasons why marking assets to market value has been an accepted practice in financial service companies for years. The first is that many of the assets are financial assets that are traded, and getting market value is relatively straightforward; there is lesser need for estimation and subjective judgment with these assets. The second is that financial service firms are less likely to hold assets to maturity; banks often securitize their loan portfolios and sell them to investors. Consequently, the market prices of these securities are more relevant when analyzing firms.

Since assets reflect current market value, rather than original cost, it can be argued that analysts should be in a much better position to value financial service firms than the rest of the market. While this may be true, there are some costs created in the process as well.

- <u>Book value = Market value:</u> Assets may be marked to market, but that does remove the need to assess their value independently. Analysts who equate book value to market value, because of marking to market, are not only abandoning their responsibility for estimating value but can make significant errors for two reasons. First, even if there is an active market from which market prices are extracted, markets can make mistakes and these mistakes will then be embedded in the book value. For instance, the book values of mortgage-backed securities at banks at the start of 2008 reflected the market prices of these securities at time. It was only when the market prices collapsed that we woke up to the realization that the book values of financial service firms overstated their true values. Second, in many cases, assets are marked to market, based not upon an observable market price, but upon models used by the appraiser; in fact, the firm that holds the securities often assesses their value for accounting purposes. Not surprisingly, there is a tendency to overstate values and a lag in recognizing changes in those values.

- <u>Measuring investment quality</u>: While we can take issue with the fact that the book value of assets at many companies reflects what was originally invested in them,

rather than current value, there is a benefit to the conventional accounting approach. One of the key determinants of the value of a company is the quality of its investments, and the most widely used measures of investment quality are accounting returns – returns on equity and capital. By looking at earnings, relative to original investment, we get an estimate of how much return that original investment is making. Thus, a firm that invested $ 800 in an asset three years ago and is generating $ 200 in after-tax earnings currently is earning a 25% return on its investment. By marking assets to market, we lose this important piece of information. In fact, if assets are truly marked to market, the return on equity on every assets should be equal to the cost of equity; there is nothing to distinguish firms making good investments from those making bad investments.

Regulation and Risk

When investing in financial service firms, we accept the fact that we know far less about their assets than we would like to know, because they are regulated. In effect, we are assuming that the regulatory authorities will keep banks and insurance companies in check and ensure that they do not over reach in their risk taking. As with marking to market, this trust can expose us to significant dangers in investing. When analysts compare the price earnings ratios of banks, for instance, and do not control for the risk of the loan portfolios of these banks, they are assuming that all banks are equally risky. Not surprisingly, riskier banks will look cheaper in this comparison.

The problem gets worse when you compare financial service firms that are covered by different regulatory regimes. A relative valuation of banks that operate in different countries will be flawed if it does not control for the regulatory differences and the resulting risk differences across these countries. Even within the same market, like the United States, investment banks, insurance companies and commercial banks face different regulatory rules, some stricter than others, and we have to consider these differences when valuing and analyzing these firms.

Discounted Cash Flow Models

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 lay out the argument that financial service firms should be valued on an equity basis, rather than as on a firm basis, and that dividends, for better or worse, are often the only tangible cash flow that we can observe or estimate. Consequently, our focus will be on variants of the dividend discount model and how they can best be used in valuing banks and insurance companies.

Equity versus Firm Valuation

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 at 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.

Even with equity valuation, we have a secondary problem. To value the equity in a firm, we normally estimate the free cashflow to equity, defined as follows:

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

If we cannot estimate 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 three 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 regulatory capital ratio constraint, it can be argued that these firms have to increase regulatory capital in order to make more loans in the future. The third is to keep the focus on excess returns, rather than on earnings, dividends and growth rates, and to value these excess returns.

Dividend Discount Models

In the basic dividend discount model, the value of a stock is the present value of the expected dividends on that stock. While many analysts view the model as old fashioned, it retains a strong following among analysts who value financial service companies, because of the difficulties we face in estimating cash flows. In this section, we will begin by laying out the basic model and then consider ways in which we can streamline its usage, when valuing financial service companies.

The standard model

If we start with the assumption that equity in a publicly traded firm has an infinite life, we arrive at the most general version of the dividend discount model:

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

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 <u>Gordon Growth model</u>.

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

In this equation, g is the expected growth rate in perpetuity and DPS_1 is the expected dividends per share next year. 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).

While the dividend discount model is intuitive and has deep roots in equity valuation, there are dangers in using the model blindly. As we noted in the section on the dark side, there are many analysts who start with the current dividends of the bank as a base, apply a growth rate to these earnings, based on either history or analyst forecasts, and compute a present value. For the model to yield a value that is reasonable, the assumptions have to be internally consistent, with the expected growth rate numbers jelling with the dividend forecasts and risk measures.

A Consistent Dividend Discount Model

Looking at the inputs into the dividend discount model, there are three sets of inputs that determine the value of equity. The first is the cost of equity that we use to discount cash flows, with the possibility that the cost may vary across time, at least for some firms. The second is the proportion of the earnings that we assume will be paid out in dividends; this is the dividend payout ratio and higher payout ratios will translate into more dividends for any given level of earnings. The third is the expected growth rate in dividends over time, which will be a function of the earnings growth rate and the accompanying payout ratio. In addition to estimating each set of inputs well, we also need to ensure that the inputs are consistent with each other.

Risk and 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). There are three estimation notes that we need to keep in mind, when making estimates of the cost of equity for a financial service firm:

a. <u>Use bottom-up betas</u>: 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. We will continue to hold to that proposition, when valuing financial service firms. In fact, the large numbers of publicly traded firm in this domain should make estimating bottom up betas much easier.

b. <u>Do not adjust for financial leverage</u>: 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.

c. <u>Adjust for regulatory and business risk</u>: If we use sector betas and do not adjust for financial leverage, we are in effect using the same beta for every company in the sector. As we noted earlier, there can be significant regulatory differences across markets, and even within a market, across different classes of financial service firms. To reflect this, we would define the sector narrowly; thus, we would look the average beta across large money center banks, when valuing a large money center bank, and across small regional banks, when valuing one of these. We would also argue that financial service firms that expand into riskier businesses – securitization, trading and investment banking – should have different (and higher betas) for these segments, and that the beta for the company should be a weighted average. Table 14.2 summarizes the betas for different groups of financial service companies, categorized by region, in February 2009.

Table 14.2: Betas for financial service businesses

Category	US	Europe	Emerging Markets
Large Money Center Banks	0.71	0.80	0.9
Small/Regional Banks	0.91	0.98	1.05
Thrifts	0.66	0.75	0.85
Brokerage Houses	1.37	1.25	1.5
Investment Banks	1.50	1.55	1.9
Life Insurance	1.17	1.20	1.1
Property and Casualty Insurance Companies	0.91	0.95	0.9

d. <u>Consider the relationship between risk and growth</u>: Through the book, we have emphasized the importance of modifying a company's risk profile to reflect

changes that we are assuming to its growth rate. As growth companies mature, betas should move towards one. We see no need to abandon that principle, when valuing banks. We would expect high growth banks to have higher betas (and costs of equity) than mature banks. In valuing such banks, we would therefore start with higher costs of equity but as we reduce growth, we would also reduce betas and costs of equity.

There is one final point that bears emphasizing here. The average betas that we get across financial service firms reflect the regulatory constraints that they operated under during that period. When significant changes are expected to regulation, we should consider the potential impact on betas across the board. For instance, the crisis of 2008 will cause banking regulations to be tightened globally and may very well push up the betas for all banks at least for the foreseeable future.

Growth and Payout

There is an inherent trade off between dividends and growth. When a company pays a larger segment of its earnings as dividends, it is reinvesting less and should thus grow more slowly. With financial service firms, this link is reinforced by the fact that the activities of these firms are subject to regulatory capital constraints; banks and insurance companies have to maintain equity (in book value terms) at specified percentages of their activities. When a company is paying out more in dividends, it is retaining less in earnings; the book value of equity increases by the retained earnings. 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.

To ensure that assumptions about dividends, earnings and growth are internally consistent, we have to bring in a measure of how well the retained equity is reinvested; the return on equity is the variable that ties together payout ratios and expected growth:

Expected growth in earnings = Return on equity * (1 – Dividend Payout ratio)

For instance, a bank that payout out 60% of its earnings as dividends and earns a return on equity of 12% will have an expected growth rate in earnings of 4.8%. However, firms can deliver growth rates that deviate from this expectation, if the return on equity is changing.

$$\text{Expected Growth}_{EPS} = \left(1 - \text{ Payout Ratio}\right)\left(ROE_{t+1}\right) + \frac{ROE_{t+1} - ROE_{t}}{ROE_{t}}$$

Thus, if the bank is able to improve the return on equity on existing assets from 10% to 12%, the efficiency growth rate in that year will be 20%. However, efficiency growth is temporary and all firms ultimately will revert back to the fundamental growth relationship.

The linkage between return on equity, growth and dividends is therefore critical in determining value in a financial service firm. At the risk of hyperbole, the key number in valuing a bank is not dividends, earnings or growth rate, but what we believe it will earn as <u>return on equity in the long term</u>. That number, in conjunction with payout ratios, will help in determining growth. Alternatively, the return on equity, together with expected growth rates, can be used to estimate dividends. This linkage is particularly useful, when we get to stable growth, where growth rates can be very different from the initial growth rates. To preserve consistency in the valuation, the payout ratio that we use in stable growth, to estimate the terminal value, should be:

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

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 14.2: Wells Fargo Banks – February 2009

In illustration 14.1, we examined the effects of leaving dividends unchanged and using historical dividend growth to value Wells Fargo in early 2009 and concluded that we would over value the firm for two reasons. First, we are overstating the expected dividends in the future by basing it on the dividends paid in 2008. Second, the growth rate we were assuming for the future (4%) may not be consistent with the payout ratio

that we were assuming in the valuation. Based on the 2008 numbers, where dividends per share were $1.30 per share and earnings per share was $1.71, the payout ratio is 76%. To deliver a growth rate of 4% a year forever, the return on equity that Wells Fargo would have to deliver on it's new investment is 16.67%.

$$\text{Implied Return on Equity} = \frac{g}{(1 - \text{Payout ratio})} = \frac{4\%}{(1 - .76)} = 16..67\%$$

If we believe that the return on equity, in the future, at Wells Fargo will be lower than 16.67%, we have to either lower growth or reduce dividends.

Rather than base the valuation on the 2008 dividend and earnings numbers, which are unstable and reflect the market crisis, we chose a different path. We started with the book value of equity of $47,628 million that Wells Fargo reported at the end of 2008, and estimated what earnings and dividends would be at a normalized return on equity. For instance, take the most the optimistic scenario, where the return on equity at Wells Fargo reverts back quickly to 18.91%, the average ROE from 2001 to 2007. The normalized net income for next year would be as follows:

Normalized net income $\quad$ = Book value of equity * Normalized ROE

$\qquad\qquad\qquad\qquad\quad$ = $47,628 million * .1891 = $9,006 million

Assuming that these earnings would grow at a stable rate of 3% a year in perpetuity, we next estimated the dividend payout ratio:

$$\text{Dividend Payout ratio} = \quad 1 - \frac{g}{\text{ROE}} = 1 - \frac{.03}{.1891} = .8414 \text{ or } 84.14\%$$

If we assume that the cost of equity of 9% that we estimated earlier is a reasonable value, we can estimate the value of equity in Wells Fargo:[1]

$$\text{Value of equity} = \frac{\text{Expected Dividends next year}}{(\text{Cost of equity - Stable growth rate})}$$

$$= \frac{\text{Net Income * Payout ratio}}{(\text{Cost of equity - Stable growth rate})} = \frac{9006 * (0.8414)}{(.09 - .03)} = \$126,293 \text{ mil}$$

Under the most optimistic scenario, Wells Fargo is significantly under valued in February 2009 at its existing market value for equity of $66,640 million.

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[1] To get to this cost of equity, we assumed a beta of one and an equity risk premium of 6%. With a riskfree rate of 3%, we obtain a cost of equity = 3% + 6% = 9%.

The two inputs that will determine the value of equity at Wells Fargo are the return on equity and the cost of equity. As we lower the return on equity, the normalized net income will decrease and the payout out ratio will decrease as well (for the given growth rate of 3%). The cost of equity can also change, if we perceive that banks have become riskier. Following the same procedure that we did for the most optimistic scenario, we valued equity at Wells Fargo under two other scenario – an intermediate scenario where the normalized return on equity drops to 15% and the cost of equity increases to 10% and a pessimistic scenario, where the return on equity reverts to 12% and the cost of equity increases to 11%. Table 14.3 summarizes our findings under each scenario:

Table 14.3: Value of Wells Fargo Equity: February 2009

	Net Income	ROE	Payout ratio	Cost of equity	Value of equity
Quick bounce back to normalcy	$9,006.45	18.91%	84.14%	9%	126293.58
Slow bounce back to normalcy	$7,144.20	15.00%	80.00%	10%	$81,648.00
Long term change to lower profitability and higher risk	$5,715.36	12.00%	75.00%	11%	$53,581.50
Market Cap (2/2009)					$66,643.00

While Wells Fargo continues to look under valued, if we assume a slow bounce back to normalcy, it does not look cheap if we assume that banks will be riskier and less profitable from this point on.

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 for financial service firms if we define reinvestment differently. 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 regulatory capital; this

is the capital as defined by the regulatory authorities, which, in turn, determines the limits on future growth.

$$\text{FCFE}_{\text{Financial Service Firm}} = \text{Net Income} - \text{Reinvestment in Regulatory Capital}$$

To estimating the reinvestment in regulatory capital, we have to define two parameters. The first is the <u>book equity capital ratio</u> that will determine the investment; this will be heavily influenced by regulatory requirements but will also reflect the choices made by a bank. Conservative banks may choose to maintain a higher capital ratio than required by regulatory authorities whereas aggressive banks may push towards the regulatory constraints. 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. The second is the <u>profitability of the activity</u>, defined in terms of net income. Staying with the bank example, we have to specify how much net income the bank will generate with the additional loans; a 0.5% profitability ratio will translate into additional net income of $1 million on the additional loans.

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 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 financial service firm.

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

Illustration 14.3: Excess Return Valuation – Goldman Sachs

In February 2009, Goldman Sachs, perhaps the best-regarded investment bank in the world, was trading at a market capitalization for equity of $48.7 billion, well below its book value of equity of $60.6 billion. A significant factor underlying the stock price collapse was the decline in profitability at the firm, which reported $2,322 million in net income in 2008, well below the $11,599 million it reported as profits in the previous year. Goldman paid out $850 million in dividends during 2008.

To value Goldman Sachs, we begin with the current cost of equity. Using the average beta of 1.50, reported by investment banks in 2008, in conjunction with a treasury bond rate of 3% and an equity risk premium of 6%, yields a cost of equity of 12% for the firm:

$$\text{Cost of equity} = 3\% + 1.5\ (6\%) = 12\%$$

While the return on equity at Goldman Sachs has ranged from 16 to 20% between 2001 and 2007, the expected return on equity, looking forward, will be much lower. For the next 5 years, we will assume that the return on equity at Goldman will be 9%, well below not only the historical average return on equity but also its own cost of equity. The resulting negative excess returns and present value are summarized in table 14.4:

Table 14.4: Excess Returns – High Growth Period

	1	2	3	4	5
Net Income	$5,941.08	$6,384.60	$6,861.23	$7,373.44	$7,923.89
- Equity Cost (see below)	$7,921.44	$8,512.80	$9,148.30	$9,831.25	$10,565.18
Excess Equity Return	-$1,980.36	-$2,128.20	-$2,287.08	-$2,457.81	-$2,641.30
Cumulated Cost of Equity	1.12000	1.25440	1.40493	1.57352	1.76234
Present Value	-$1,768.18	-$1,696.59	-$1,627.90	-$1,561.98	-$1,498.74
Beginning BV of Equity	$66,012.00	$70,939.98	$76,235.86	$81,927.08	$88,043.17
Cost of Equity	12.00%	12.00%	12.00%	12.00%	12.00%
Equity Cost	$7,921.44	$8,512.80	$9,148.30	$9,831.25	$10,565.18
Return on Equity	9.00%	9.00%	9.00%	9.00%	9.00%
Net Income	$5,941.08	$6,384.60	$6,861.23	$7,373.44	$7,923.89
Dividend Payout Ratio	17.05%	17.05%	17.05%	17.05%	17.05%
Dividends paid	$1,013.10	$1,088.73	$1,170.00	$1,257.35	$1,351.21
Retained Earnings	$4,927.98	$5,295.87	$5,691.22	$6,116.09	$6,572.67

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 dividend payout ratio is based upon current dividends and normalized earnings.

To put closure on this valuation, we have to make assumptions about excess returns after year 5. We assumed that the net income would grow 3% a year beyond year 5 and that the beta for the stock would decline to 1.20. For Goldman Sachs, we will assume that the return on equity after year 5 will be 10.20%, set equal to the cost of equity in stable growth:

Cost of equity in stable growth period = 3% + 1.2(6%) = 10.20%

$Net\ Income_6$ = Book value of equity at start of year 6* Stable ROE

$$= (\$88,043*1.03) *.102 = \$9249.82 \text{ million}$$

Note that the net income in year 6 is significantly higher than the net income in year 5, as the return on equity bounces back from 9% to 10.20%. The terminal value of excess returns to equity investors can then be computed.

$$\text{Terminal value of excess returns} = \frac{\text{Net Income}_6 - (\text{Cost of equity}_6)(\text{BV of Equity}_6)}{\text{Cost of equity} - \text{Expected growth rate}}$$

$$= \frac{9,249.82 - (90684.47)(0.102)}{0.102 - 0.03}$$

$$= \$0$$

Since the firm earns its cost of equity after year 5, there is no value gained or lost after that year. 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   = $66,012

PV of Equity Excess Return – next 5 years   =   - $8,154

PV of terminal value of excess returns   =   0

Value of Equity   = $57,859

Number of shares   =   461.874

Value Per Share   = $125.29

At the time of this valuation in February 2009, Goldman Sachs was trading at $ 96.45 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, portfolio management – would need to be valued separately, with different income streams and different discount rates.

Relative Valuation

There are 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.

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

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 14.4: Comparing PE ratios: Insurance Companies

In Table 14.5, we compare the current price earnings ratios of life insurance companies in February 2009.

Table 14.5: PE Ratios and Expected Growth Rates – Insurance Companies

Company Name	PE Ratio	Expected growth in EPS	Beta
Torchmark Corp. (NYSE:TMK)	4.11	3.60%	1.87
Odyssey Re Holdings Corp. (NYSE:ORH)	5.15	4.00%	1.53
Manulife Financial Corporation (TSX:MFC)	5.4	5.20%	2.41
MetLife, Inc. (NYSE:MET)	5.45	4.50%	1.96
Assurant Inc. (NYSE:AIZ)	5.56	5.00%	2.16
Principal Financial Group Inc. (NYSE:PFG)	5.85	5.50%	2.15
AFLAC Inc. (NYSE:AFL)	6.01	6.40%	2.4
Unum Group (NYSE:UNM)	6.33	6.00%	1.47
Aon Corporation (NYSE:AOC)	7.04	6.20%	1.7
The Travelers Companies, Inc. (NYSE:TRV)	7.58	6.00%	1.87
HCC Insurance Holdings Inc. (NYSE:HCC)	7.75	7.00%	2.05
The Chubb Corporation (NYSE:CB)	7.94	10.50%	1.67
American Financial Group Inc. (NYSE:AFG)	9.41	11.00%	1.31
ProAssurance Corporation (NYSE:PRA)	10.74	10.30%	0.89
Reinsurance Group of America Inc. (NYSE:RGA)	11.71	11.50%	1.24
W.R. Berkley Corporation (NYSE:WRB)	12.3	12.50%	1.98
Sun Life Financial Inc. (TSX:SLF)	12.8	10.00%	1.16
RLI Corp. (NYSE:RLI)	13.48	13.00%	1.62
Brown & Brown Inc. (NYSE:BRO)	14.36	13.70%	1.44
Arthur J Gallagher & Co. (NYSE:AJG)	20.21	12.67%	1.21

Transatlantic Holdings Inc. (NYSE:TRH)	20.36	15.00%	1.22
Lincoln National Corp. (NYSE:LNC)	30.5	10.20%	0.86
The Hanover Insurance Group Inc. (NYSE:THG)	35.52	15.00%	0.98

The PE ratios vary widely and range from 4.11 for Nationwide Financial to 35.52 for the Hanover Insurance Group. We also report the consensus estimates by analysts of the growth rate in earnings per share over the next 5 years and the equity beta for each of these firms, as a proxy for risk. 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 = 12.41 + 109.95 Expected Growth Rate – 6.60 Beta R^2=59%

        (1.61)   (2.86)   (-2.14)

The regression confirms the intuition that higher growth and lower risk firms have higher PE ratios than other firms. Table 14.6 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.

Table 14.6: Predicted and Actual PE ratios: Insurance Companies in February 2009

Company Name	PE Ratio	Predicted PE	% Under or over valued
American Financial Group Inc. (NYSE:AFG)	9.41	15.86	-40.66%
ProAssurance Corporation (NYSE:PRA)	10.74	17.86	-39.87%
The Chubb Corporation (NYSE:CB)	7.94	12.93	-38.61%
Unum Group (NYSE:UNM)	6.33	9.31	-31.97%
Reinsurance Group of America Inc. (NYSE:RGA)	11.71	16.87	-30.59%
Odyssey Re Holdings Corp. (NYSE:ORH)	5.15	6.71	-23.25%
Brown & Brown Inc. (NYSE:BRO)	14.36	17.97	-20.09%
Sun Life Financial Inc. (TSX:SLF)	12.8	15.75	-18.72%
RLI Corp. (NYSE:RLI)	13.48	16.01	-15.81%
Aon Corporation (NYSE:AOC)	7.04	8.01	-12.08%
W.R. Berkley Corporation (NYSE:WRB)	12.3	13.09	-6.00%
Transatlantic Holdings Inc. (NYSE:TRH)	20.36	20.85	-2.35%
Torchmark Corp. (NYSE:TMK)	4.11	4.03	2.08%
Arthur J Gallagher & Co. (NYSE:AJG)	20.21	18.35	10.11%
The Travelers Companies, Inc. (NYSE:TRV)	7.58	6.67	13.73%
HCC Insurance Holdings Inc. (NYSE:HCC)	7.75	6.58	17.84%
MetLife, Inc. (NYSE:MET)	5.45	4.42	23.25%

Principal Financial Group Inc. (NYSE:PFG)	5.85	4.27	37.09%
Assurant Inc. (NYSE:AIZ)	5.56	3.65	52.27%
The Hanover Insurance Group Inc. (NYSE:THG)	35.52	22.43	58.33%
AFLAC Inc. (NYSE:AFL)	6.01	3.61	66.63%
Lincoln National Corp. (NYSE:LNC)	30.5	17.95	69.93%
Manulife Financial Corporation (TSX:MFC)	5.4	2.22	143.09%

Based upon this regression, Manulife Financial looks significantly overvalued while American Financial and ProAssurance look significantly undervalued.

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.

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

Other things 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 U.S. commercial banks with market capitalization exceeding $ 1 billion, in the United States in February 2009, in figure 14.2.

Figure 14.2: Price to Book Ratios and Returns on Equity: Banks
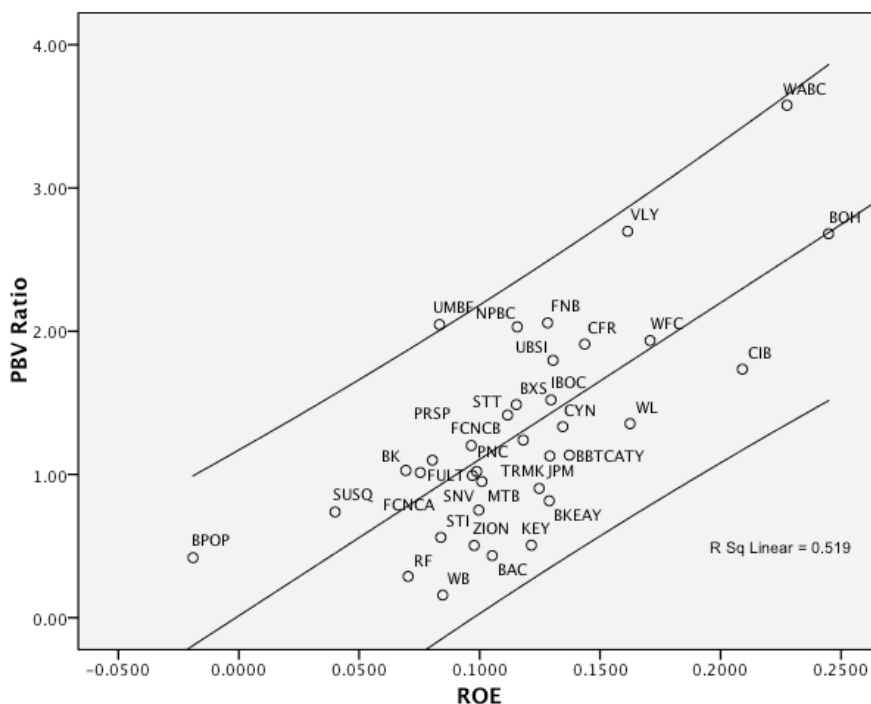
[a]Regression line, with 90% confidence range on estimate.

Note that these numbers were extracted in the midst of the biggest crisis in banking since the Great Depression, and in an environment where most analysts have come to the conclusion that investors are in crisis mode and that equity values in banks reflect the panic and irrationality. It is therefore astounding how close the link is between price to book ratios for banks in February 2009 and the returns on equity, based upon trailing 12-month earnings. Banks such as Valley National (VLY) and WestAmerica Bancorp (WABC) that have high price to book value ratios tend to have high returns on equity. Banks such as Banco Popular (BPOP) and Wachovia (WB) that have low returns on equity trade at low price to book value ratios. The correlation between price to book ratios and returns on equity is in excess of 0.70. Put another way, there seems to be a fundamental order to the chaos that has undercut the banking sector.

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. In February 2009, one factor that should make a difference is the exposure that different banks have to toxic securities – mortgage backed bonds and collateralized debt obligations (CDOs) – on their balance sheets.

Illustration 14.5: Price to Book Value Ratios: Small commercial banks

In figure 14.2, we noted the strong relationship between price to book ratios and returns on equity at large banks. Does the same apply relationship apply to smaller banks? To answer to this question, we looked at banks with market capitalizations between $ 500 million and $ 1 billion in table 14.7:

Table 14.7: Price to Book Ratios and Returns on Equity: Small Commercial Banks

Company Name	PBV Ratio	Expected Growth in EPS: next 5 years	Std deviation in stock prices	ROE
East West Bancorp	0.76	-2.50%	57.75%	13.76%
Webster Fin'l	0.37	2.00%	31.06%	6.44%
NBT Bancorp	2.13	5.00%	32.72%	12.66%
PacWest Bancorp	0.60	5.00%	40.09%	7.93%
WesBanco	1.08	5.00%	41.77%	7.70%
Chemical Financial	1.12	5.00%	33.98%	7.67%
CVB Financial	2.05	6.33%	33.02%	14.26%
First Commonwealth	1.52	6.50%	30.81%	8.14%
Pacific Cap. Bancorp	1.13	6.50%	42.12%	13.26%
Community Bank Sys.	1.43	7.30%	24.10%	8.96%
First Busey Corp	1.17	8.00%	30.34%	5.95%
Tompkins Financial Corp	2.75	8.00%	27.89%	13.39%
S & T Bancorp	2.70	9.00%	23.69%	16.62%
Umpqua Holdings Corporation	0.68	10.00%	30.42%	5.11%
MB Finl Inc	1.07	12.00%	25.50%	7.19%
PrivateBancorp Inc	2.17	15.60%	41.03%	2.57%
Pinnacle Financial Prtners Inc	1.34	16.00%	33.69%	4.93%
UCBH Hldgs Inc	0.61	24.33%	77.25%	11.35%

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. Since the assumption about all banks being equally risky was put to the test during this period, we used the standard deviation in stock price as a

proxy for this risk. Regressing the price to book ratios against the return on equity and standard deviation yields the following:[2]

Price to Book Ratio = 1.527   + 8.63 (Return on Equity) -2.63 ($\sigma_{\text{Stock price}}$) R^2 = 31%
                          (2.94)   (1.93)   (2.36)

Using this regression yields predicted price to book ratios for any firm in the sample. For instance, the predicted price to book ratio for Tompkins Financial, which at 2.75 times book value of equity looks expensive, would be:

Predicted P/BV for Tompkins Financial = 1.527 + 8.63 (0.1338) – 2.63 (0.2789)= 1.95

Based on how other small banks are priced, Tompkins looks over valued by about 30%.

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

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[2] With 18 firms in the sample, we are pushing the limits of allowable independent variables, with two. A larger sample will provide more precision.

authorities may restrict the potential excess returns that a firm may be able to make by preventing the firm from entering a business.