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Editorial

Valuing financial services firms

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Abstract
Valuing banks, insurance companies, and investment banks has always been a daunting exercise, but the rolling market crises of the last few years have made a difficult job even more so. There are two key measurement problems that you face in valuing financial services firms. The first is that the cash flows cannot be easily estimated, since many of the ingredients needed are not clearly defined. The second is that most financial services firms operate under regulatory frameworks that govern how they are capitalized, where they invest, and how fast they can grow. Consequently, changes in the regulatory environment can create large shifts in value. In this paper, we confront both factors. We argue that financial services firms should be valued using equity valuation models, rather than enterprise valuation models, and with actual or potential dividends used as cash flows. The two key numbers that drive value are the cost of equity, which is a function of the risk that emanates from the firm's investments, and the return on equity, which is determined by the company's investment choices and regulatory restrictions.

Introduction

The principles of valuation are well established. Thus, the value of a business or asset can be estimated in one of two ways. The expected cash flows from owning the business can be discounted back at a risk-adjusted rate to arrive at an intrinsic value. Alternatively, the asset or business can be valued by looking at how the market is pricing similar assets or businesses in a relative valuation. While these principles should apply just as much when you are valuing banks, insurance companies, and other financial services firms as they do when valuing other firms, these firms pose special challenges for an analyst attempting to value them, for three reasons. The first is that 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 these firms tend to be heavily regulated and changes in regulatory requirements can have a significant effect on value. The third is that the accounting rules that govern accounting for financial services firms have historically been very different from the accounting rules for other firms, with assets being marked to market more frequently.

In this paper, we begin by considering what makes financial services 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 services firms by laying out four alternatives – the classic dividend discount model, a creative version of a cash flow to equity model, an excess return model, and an asset-based model. Using these models, we derive the key drivers of value for a financial services firm, and use them to examine how relative valuation works within financial services firms and what multiples may work best with these firms.

Financial services firms – the big picture

Any firm that provides financial products and services to individuals or other firms can be categorized as a financial services firm. We would categorize financial services 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 its 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, many money center banks like Bank of America and Citigroup operate 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.

Financial sector	Number	Market capitalization	% of overall market
Banks	471	$1,068,475	5.28%
Financial services	225	$593,952	2.93%
Insurance (life)	30	$161,374	0.80%
Insurance (property/casualty)	49	$174,876	0.86%
Securities brokerage	28	$156,940	0.77%
Thrift	148	$38,342	0.19%
All financial services firms	951	$2,193,959	10.83%

Table 1: Financial services firms – market capitalizations on January 1, 2012 (in millions)

Financial sector	1/1/2008	1/1/2009	1/1/2010	1/1/2011	1/1/2012
Banks	4.68%	4.80%	5.16%	5.51%	5.28%
Financial services	4.50%	3.04%	2.63%	2.60%	2.93%
Insurance (ife)	1.33%	0.35%	1.08%	1.10%	0.80%
Insurance (property/ casualty)	6.28%	7.40%	0.97%	0.95%	0.86%
Securities brokerage	1.42%	0.87%	1.16%	1.07%	0.77%
Thrift	0.30%	0.36%	0.26%	0.32%	0.19%
All financial services firms	18.51%	16.81%	11.26%	11.55%	10.83%

Table 2: Financial services firms – market capitalization as percentage of the U.S. market (1 January 2008 – 1 January 2012)

How big is the financial services sector in the United States? We would not be exaggerating if we said that the development of the U.S. economy 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 services firms have been the foundation

of the U.S. economy for decades and the results can be seen in many measures. Table 1 summarizes the market capitalization of publicly traded banks, insurance companies, brokerage houses, investment firms, and thrifts in the U.S. at the end of 2011 and the proportion of the overall equity market that they represented at the time. In addition, the financial services sector, in the 2002 economic census, accounted for 6% of all full-time employees in the U.S.

The last 5 years have been tumultuous years for the overall market, and even more so for financial services firms. To the extent that the crisis of 2008 can be traced to the failures of banks and other financial services firms, it is worth looking at how the market capitalization of these firms has changed between 2007 and 2011, relative to the market, at least in the U.S. (Table 2).

Financial services firms have become a smaller proportion of the overall market, but the bulk of the change has occurred in the property/casualty insurance companies, where the restructuring of AIG has had a dramatic impact.

What about outside the U.S.? To answer this question, we looked at the proportion of overall market value accounted for by financial services firms globally, as well as just in emerging markets, in Figure 1.

In emerging markets, banks account for a larger proportion of the overall market value than they do in developed markets. In addition, financial services firms range the spectrum, from small to large, mature to growing, in developed and in emerging markets, and it is quite clear that no one template will value all financial services firms and that we have to be flexible in our use of valuation models.

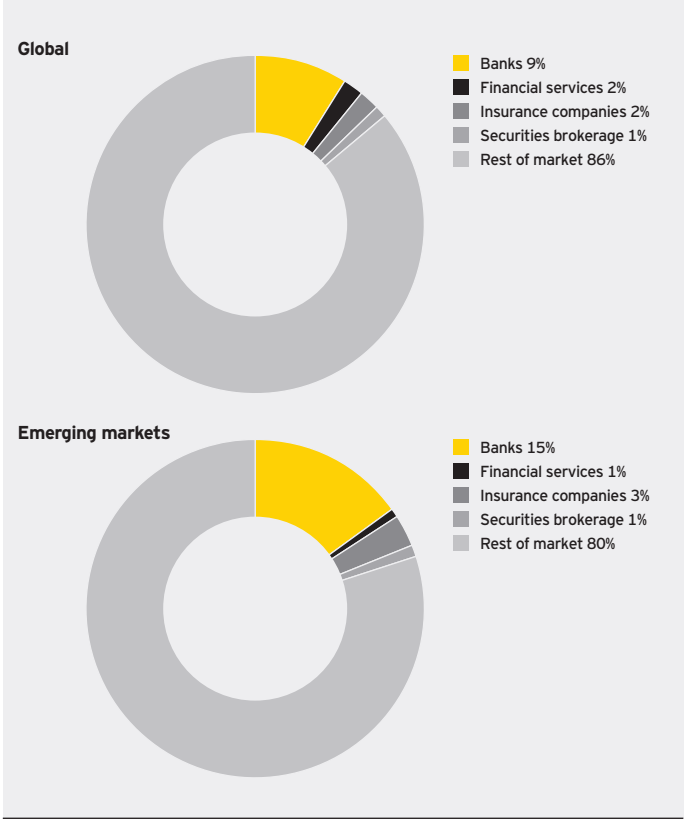

Figure 1: Financial services firms versus rest of the market: global – January 2012

Characteristics of financial services firms

In this section, we will focus on four key differences between financial services firms and the rest of the market, and look at why these differences can create estimation issues in valuation. The first is that many categories (albeit not all) of financial services firms operate under regulatory constraints 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 values at financial services firms are at variance with accounting rules for the rest of the market. The third is that debt for a financial services firm is more akin to raw materials 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 defining reinvestment (net capital expenditures and working capital) for a bank or insurance company may be not just difficult, but impossible, and cash flows cannot be easily computed.

The regulatory overlay

Financial services 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, based upon their risk exposure, to ensure that they do not expand beyond their means, and put

their claimholders or depositors at risk. Second, financial services 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 U.S. restricted commercial banks from investment banking activities as well as from taking active equity positions in nonfinancial services 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 services firms, these assumptions also have to be scrutinized to ensure that they pass regulatory constraints. There might also be implications for how we measure risk at financial services 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 values are different for financial services firms than for the rest of the market, for two reasons. The first is that the assets of financial services firms tend to be financial instruments (bonds, securitized obligations) that are often traded. Not surprisingly, marking assets to market value has been an established practice in financial services firms, well before other firms even started talking about fair value accounting. The second is that the nature of operations for a financial services firm is such that long periods of profitability are interspersed with short periods of large losses; accounting standards have been developed to counter this tendency and create smoother earnings.

- **Mark to market** – if the new trend in accounting is towards recording assets at fair value (rather than original costs), financial services firms operate as a long-standing 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 decades, 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 on the part of accountants. To the extent that some, or a significant portion, of the assets of financial services firms are marked to market, and the assets of most nonfinancial services firms are not, we face 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 nonfinancial services firms. The second is in interpreting these ratios, once computed. While the return on equity for a nonfinancial services firm can be considered a measure of return earned on equity invested originally in assets, the same cannot be said about the return on equity at financial services firms, where the book value of equity measures not what was originally invested in assets but an updated market value (or at least the accountant's measure of that market value).
- **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

There are only two ways to raise funds to finance a business – debt and equity. While this is true for all firms, financial services firms differ from nonfinancial service firms on three dimensions:

- **Debt is raw material, not capital** – when we talk about capital for nonfinancial services firms, we tend to talk about both debt and equity. A conventional business raises capital from both equity investors and bondholders (and banks) and uses these funds to finance its investments. When we value the firm, we value the assets owned by the firm, rather than just the value of its equity. With a financial services firm, debt has a different connotation. Rather than viewing debt as a source of capital,

most financial services firms view it as a raw material. In other words, debt is to a bank what steel is to an automobile company, something to be molded into products which can then be sold at a higher price and yield a profit. Consequently, capital at financial services firms is narrowly defined as including only equity capital. This narrow definition of capital is reinforced by the regulatory authorities, whose core measures of regulatory capital are built around equity.

- **Defining debt** – the definition of what comprises debt is also murkier with a financial services firm than it is with other types of firms. 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.
- **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 services 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 services firm, small changes in the value of the firm's assets can translate into big swings in equity value.

Estimating cashflows is difficult

We noted earlier that financial services firms are constrained by regulation in terms of both where they invest their funds and how much they invest. If we define reinvestment as necessary for future growth, there are problems associated with measuring reinvestment for financial services firms. Note that we consider two items in reinvestment – net capital expenditures and working capital, and measuring either of these items at a financial services firm can be problematic.

Consider net capital expenditures first. Unlike manufacturing firms that invest in plant, equipment, and other fixed assets, financial services firms invest primarily in intangible assets such as brand name and human capital. Consequently, their investments for future growth are often categorized as operating expenses in accounting statements. Not surprisingly, the statement of cashflows for a bank shows 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 with 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 cashflows without estimating reinvestment. In other words, if we cannot identify how much a company is reinvesting for future growth, we cannot estimate its free cash flows today. The second is that estimating expected future growth becomes more difficult if the reinvestment rate cannot be measured.

The intrinsic value of a bank

In a discounted cash flow model, we consider the value of an asset to be the present value of the expected cashflows generated by that asset. In this section, we first lay out the argument that financial services firms should be valued on an equity basis, rather than on a firm basis, and that dividends, for better or worse, are often the only tangible cashflow that we can observe or estimate. Consequently, our focus will be on variants of the equity valuation models and how they can best be used in valuing banks, investment banks, and insurance companies.

Equity versus firm valuation

Note 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 cashflows to equity investors at the cost of equity. Estimating cashflows 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 services 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 services 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 services firms, we have four choices. The first is to use dividends as cashflows to equity and assume that firms, over time, pay out their free cashflows 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 services 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. In the final approach, we value financial services firms based upon net asset values, where we value the assets today and subtract out debt.

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 services companies, because of the difficulties we face in estimating cashflows. 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 services 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 "Gordon growth model."

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

In this equation, g is the expected growth rate in perpetuity and DPS1 is the expected dividends per share next year. In the more general case, where dividends are growing at a rate that is too high to be sustainable in the long term (called the extraordinary growth period), we can still assume that the growth rate will become sustainable (and constant) 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, gn is the expected growth rate after n years and ke 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. There are many analysts who start with the current dividends as a base, apply a growth rate to these earnings, based on either history or 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 gelling with the dividend forecasts and risk measures. In addition, we are assuming that the current dividends reflect what the firm has available to pay out, rather than the whims of management.

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 cashflows, 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 general, the more you pay out in dividends, the lower your expected growth rate will tend to be. In addition to estimating each set of inputs well, you also need to ensure that the inputs are consistent with each other.

Risk and cost of equity

As with any publicly traded company, the cost of equity for a financial services firm has to reflect the portion of the risk in the equity that cannot be diversified away by the marginal investors in the stock. This risk can be estimated using a beta (in the capital asset pricing model) or betas (in a multi-factor or arbitrage pricing model). The broad principles on estimating cost of equity are simple:

- **Reflect risk of business** – the cost of equity should reflect the riskiness of the business or businesses that a financial services firm derives its revenues from. Thus, the cost of equity for a bank that chooses to lend to "riskier" customers should be higher than for one that lends only to "safe" customers. In a similar vein, the cost of equity for a bank that derives more of its revenues from proprietary trading should be higher than the cost of equity for one that gets all its revenues from conventional banking.
- **Can be correlated with growth** – financial services firms that push for more growth often have to enter riskier businesses. Consequently, you would expect the cost of equity for higher growth banks and insurance companies to be higher than for more mature companies in the same space.
- **Can change over time** – if risk is a function of your business mix and expected growth, it follows that the risk of a financial services firm should change over time, as its business mix changes and its growth potential subsides.

There are clearly regulatory and measurement issues that are specific to financial services firms and we will return to address those later in the paper.

Growth and payout

There is an inherent tradeoff 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 services 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 services 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 pays 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.

$$\text{Expected growth}_{EPS} = (1 - \text{Payout ratio})(ROE_{t+1}) + \frac{ROE_{t+1} - ROE_t}{ROE_t}$$

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 will ultimately revert to the fundamental growth relationship.

The linkage between return on equity, growth, and dividends is therefore critical in determining value in a financial services 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 "return on equity in the long term." 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.

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 services 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 services 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. The key to using this model then becomes an understanding of the regulatory structure governing financial services firms.

Regulatory capital

One of the legacies of the Great Depression was the introduction of a regulatory overlay to prevent banks from collapsing and the social costs from the ensuing bank runs. As part of that overlay, banks and other financial services companies have been required to hold "equity" capital to cover potential losses and shortfalls from their operations, with the required holding being a function of the scale and risk of their business. In the decades since, some firms have tested the regulatory constraints by increasing the risk exposure of their businesses without increasing their regulatory capital holdings and the regulatory authorities have responded to the inevitable "crisis" by increasing capital requirements and/or oversight of business risk.

The framework for capital regulation is contained in the Basel accords, though individual countries have their own supplemental regulations. These regulations are built around two measurement principles:

- **Risk-adjusted assets** – building on the proposition that the capital set aside has to be greater for banks that hold riskier assets, bank regulators have created adjustment mechanisms that try to take risk into consideration when measuring assets. Rather than set different capital ratios for asset holdings with different risk levels, regulations have been built around adjusting the value of the assets for risk, with higher risk translating into higher risk-adjusted values.
- **Regulatory capital** – banks are required to maintain minimum capital to sustain their operations, and there are two measures of capital. Tier 1 capital is the narrower measure and is composed primarily of common equity but also includes non-cumulative preferred stock. Tier 2 capital is a broader measure of capital that includes subordinated debt and cumulative preferred stock.

Individual banks are free to hold more capital, if they so desire, and more conservative banks therefore will set their regulatory capital ratios at above the regulatory minimum.

If regulatory capital has to be maintained at a percentage of risk-adjusted assets or some measure of operations, there are three factors that determine how much a company will have to invest in regulatory capital in the future. The first is the current level of regulatory capital relative to a target capital ratio; this target will reflect not only regulatory requirements but also the degree of risk aversion among the firm's managers. If a financial services firm has too little regulatory capital relative to its target, it will have to set aside more of its earnings into regulatory capital, thus leaving less to be paid out in dividends. In contrast, a bank that is over-capitalized may be able to pay much higher dividends, given its earnings, as the drawdown of regulatory capital will release more cash for stockholders. The second is the expected growth in operations over time; even a bank that is at its desired

regulatory capital ratio will have to reinvest more in regulatory capital if it expects growth of 10% a year for the next few years. The third factor is the degree of risk that the firm chooses to expose itself to: a bank or investment bank that chooses to enter riskier businesses (perhaps in search of profitability) will find itself needing to invest more in regulatory capital to reflect the higher risk.

When valuing a bank using the FCFE model, you have to estimate a regulatory capital ratio for the bank and you can use the model on the following approaches:

- Leave the regulatory capital ratio at the current level, on the assumption that barring information to the contrary, this is your best estimate for the future. Thus, the reinvestment in regulatory capital will track the expected growth in risk-adjusted assets over time.
- Obtain a target capital ratio from the bank's management (and some banks are more transparent than others), based upon their expectations of regulatory changes and their desire to maintain a buffer. You can then make a judgment of the time period over which the firm will move from the existing ratio to the target ratio and incorporate the resulting reinvestment into your cashflow forecasts.
- If you do not feel comfortable staying with the existing regulatory capital ratio and have no indication about a target ratio from the management, you can assume that the firm will move towards the industry norm. This industry norm can be defined as the median regulatory capital ratio across all banks or, at least, the banks that would be viewed as being part of the peer group.

What is a normal regulatory capital ratio? To answer this question, we look at the distribution of tier 1 capital, as a percentage of risk adjusted assets, at U.S. banks, in November 2012, in figure 2.

Note the variation in capital holdings across banks, with some holding more regulatory capital than others, as a percent of risk adjusted assets. The median across all U.S. banks in November 2012 was 14.52% but the highest tier 1 capital ratio was 33.4% and the lowest was in the single digits.

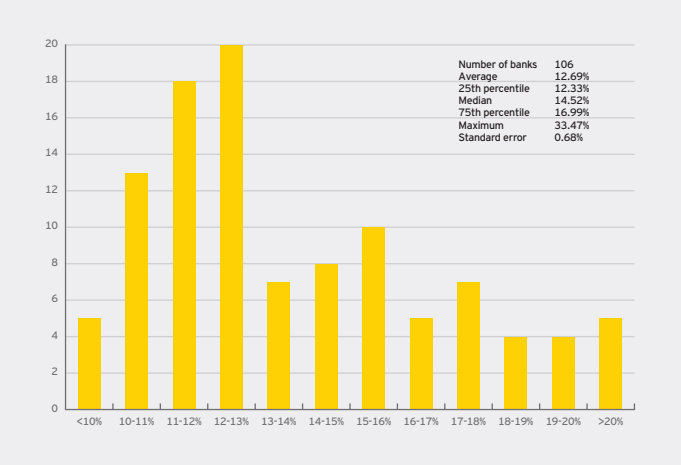

Figure 2: U.S. banks' tier 1 capital as a percentage of risk-adjusted assets

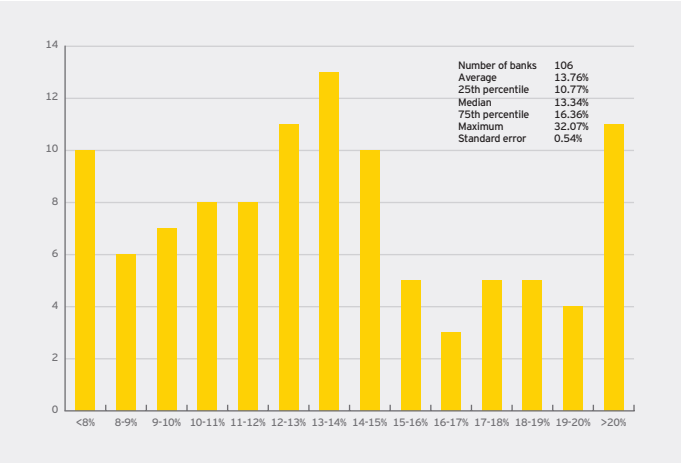

Figure 3: Common equity as a percentage of tier 1 capital

There is also a secondary factor at play that stems from what the regulatory authorities count towards "regulatory capital." For instance, capital raised from non-cumulative preferred stock can be counted towards tier 1 capital and a bank that issues preferred stock may not need to invest as much of its common earnings back into the business. This benefit, though, has to be offset against the preferred dividends that will have to be paid each period, which will lower the net income. In Figure 3, we look at a

more primitive measure of capital, book value of common equity, as a percentage of risk-adjusted assets at U.S. banks in November 2012. For most banks, the core portion of tier 1 capital comes from common equity, though it is supplemented with non-cumulative preferred stock and other non-common equity capital, to different degrees, by different banks.

Implementing an FCFE model

To implement an FCFE model, you need two ingredients. The first is the expected net income over time, which will be a function not only of the profitability of the businesses that the financial services firm is involved in but will also be determined by the cash flow claims of lenders, preferred stockholders, and other non-common claimholders. The second is the investment in regulatory capital, which will be a function of both the degree to which the financial services firm is under or over-capitalized to begin the process and the expected growth rate in its risk-adjusted assets.

$FCFE_{\text{Financial services firm}}$ = net income − reinvestment in regulatory capital

Note that the reinvestment in regulatory capital can exceed the net income under two scenarios. The first is if you have a severely under-capitalized bank that has to replenish its regulatory capital to meet a standard; the undercapitalization itself may have been triggered by losses on existing assets (loans or security holdings). The second is a high-growth bank that has to keep its regulatory capital growing at a high rate to sustain its asset growth. In either case, the negative FCFE will have to be covered with new equity issues over time, thus depressing what you are willing to pay for the common stock today. If the net income is greater than the reinvestment, the FCFE will be positive and can be viewed as potential dividends. By discounting these FCFE, you are, in effect, laying claim to these cashflows, even if the bank does not pay them out as dividends.

Reconciling dividend and FCFE models

If a bank can be valued using both a dividend discount model and an FCFE model, should you get the same value using both approaches? No, and the differences between the two approaches can be summarized as follows:

- In the dividend discount model, you are assuming that what gets paid out as dividend is a good measure of what could have been paid out. Thus, you are assuming that the managers of financial services companies are sensible people who pay dividends only if they can and do not hold back cash. To the extent that firms do sometimes pay out more than they can afford to or hold back cash, the dividend discount model can overestimate or underestimate value.
- If you have negative FCFE, the FCFE model automatically incorporates the effect of the dilution that will arise (from the new stock issue) into the present value; the negative FCFE in the early years reduce the present value of the overall cash flows. In the dividend discount model, you have to explicitly adjust the number of shares for expected future dilution. If you do not do so, the dividend discount model will overestimate the value of equity in financial services firms with negative free cashflows to equity.

Excess return models

The third approach to valuing financial services firms is to use an excess return model. In this 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 services firm.

Basic model

Given the difficulty associated with defining total capital in a financial services firm, it makes far more sense to focus on just equity when using an excess return model to value the 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 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 services firm will direct its future investments but also the returns it will make on those investments. To the extent that the firm will generate returns on equity on these new investments that exceed (are less than) the cost of equity, the additional investments (growth) will add to (reduce) the value of equity in the firm.

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 from new equity investments in future periods.

The equity capital currently invested 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 services firm than in a manufacturing firm for two reasons. The first is that the assets of a financial services firm are often financial assets that are marked 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 skew book value for manufacturing firms, is often negligible at financial services firms. Notwithstanding this fact, the book value of equity can be affected by stock buybacks and extraordinary or one-time charges. The book value of equity for financial services 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 services firm, we can obtain the return on equity from the current and past periods, but the return on equity that is required is the return you will earn on future investments. This requires an analysis of the firm's strengths and weaknesses, as well as the competition faced by the firm; banks that have strong competitive advantages will generate much higher returns on equity.

Implications of model

Linking the value of a financial services firm to its base capital and the excess returns it earns on that capital (and additions to it) provides a useful tool for assessing the market value of the firm, relative to its book value for equity. In particular, if markets expect a financial services firm to generate returns on equity that are less than the cost of equity on its existing assets, they will push the market value of equity below the book value of equity. If this firm then proceeds to invest in growth with the same characteristics, the discount on book value will get larger.

The model can be reversed to estimate imputed returns on equity from the price to book ratio. Thus, in a stable growth firm, the imputed ROE is:

$$\text{PBV} = \frac{\text{Market value of equity}}{\text{Book value of equity}} = \frac{(\text{ROE - expected growth rate})}{(\text{Cost of equity - Expected growth rate})}$$

Imputed ROE = PBV (cost of equity − expected growth rate) + expected growth rate

To illustrate, Citigroup was trading at a price to book ratio of 0.70 in November 2012. If we attach a cost of equity of 9% to the company and assume that it is in stable growth (growing at 2% a year), the imputed ROE for Citigroup can be computed as follows:

Imputed ROE for Citigroup = 0.70 (.09 - .02) + .02 = 6.9%

Thus, the market is anticipating that Citigroup will generate a return on equity 2.1% less than its cost of equity on both its existing assets and on new investments for the foreseeable future.

The trend line in price to book ratios across all banks has been negative since the 2008 banking crisis. In Figure 4, we look at the average price to book ratios and returns on equity for U.S. banks going back to 2002. Note the elevated price to book ratios for most of the last decade, as returns on equity stayed high. Note also the precipitous collapse in 2009, after returns on equity crashed in the aftermath of the 2008 crisis. While price to book ratios recovered

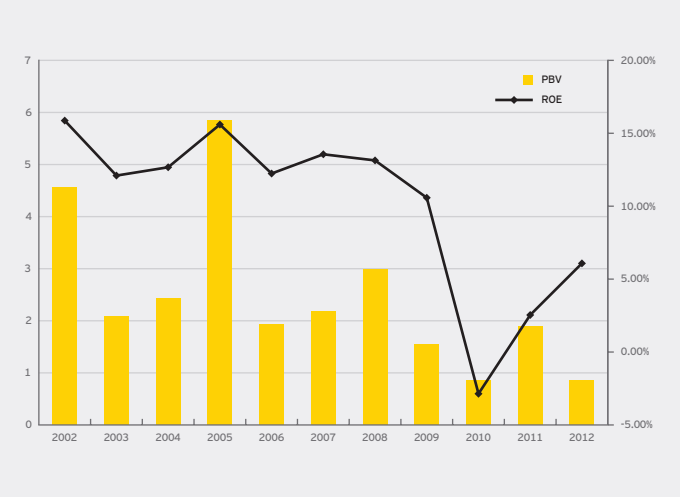

Figure 4: Price to book ratio for U.S. banks: 2002-2012

in 2010, with the partial bounce back in return on equity, markets have become decidedly more negative in their outlook again in 2011, even as returns on equity continue to improve.

Asset based valuation

In asset-based valuation, we value the existing assets of a financial services firm net of 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.

Valuing assets

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 services firm, but the better approach is to value it based upon the expected cash flows. Consider, for instance, a bank with a U.S.$1 billion loan portfolio with a weighted average maturity of 8 years, on which it earns interest income of U.S.$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.

$$\text{Value of loans} = \text{U.S.\$70 million (PV of annuity, 8 years, 6.5\%)} + \frac{(\text{U.S.\$1,000million})}{1.065^{8}} = \text{U.S.\$1,030 million}$$

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.

Limitations of approach

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 services 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.

The drivers of value

While we presented four different valuation models that we can use to value banks, the drivers of value are the same across these models: the risk in the equity earnings to the firm, the expected growth in these earnings over time, and the quality of the growth. In this section, we take a closer look at each of these determinants.

Risk

As with any other set of companies, the primary risk that we worry about when investing in a bank or insurance company is that its earnings will be volatile over time. As investors, we then have to parse this risk to evaluate how much of it we will still be exposed to, in our portfolios, as "diversified" investors. That is the risk we

capture in the cost of equity in any discounted cashflow model. The basic proposition, then, is a simple one. A financial services firm that is more exposed to risk should be valued less than an otherwise similar financial services firm (in terms of growth level and quality).

Risk measures

In our earlier discussion of cost of equity, we suggested that the conventional models for measuring equity risk (using beta or betas) can be adapted to obtain costs of equity for financial services firms. We would argue against the use of a regression beta (with returns on a stock regressed against the market index) because of the noise in the estimates (standard errors) and the possibility that the firm has changed over the period of the regression, and the use of a sector average for the business. While the standard practice with nonfinancial services firms is to unlever these sector average betas and then relever them again, using the company's debt to equity ratio, we would skip this step for two reasons. First, financial services firms tend to be much more homogeneous in terms of capital structure – they tend to have similar financial leverage primarily due to regulatory restrictions. Second, and this is a point made earlier, debt is difficult to measure for financial services 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.

Risk variation across businesses

Valuations would be far simpler if financial services firms operated in a single business, with homogeneous risk. Over the last few decades, a combination of regulatory changes and securitization has made financial services firms much more complex. As a consequence, the large money center banks operate as financial supermarkets, deriving their revenues from many different businesses, with very different risk profiles. In practical terms, this business diversity shows up as different costs of equity for different businesses, with riskier businesses (such as proprietary trading) having much higher risk exposure (and cost of equity) than safer businesses. While you can still compute one beta for a complex financial services firm, reflecting the weights of its different businesses, changes in these weights will translate into changes in the composite cost of equity over time. In fact, a failure to do so will result in the overvaluation of banks that grow their riskier businesses at faster rates than their safer businesses.

Category	U.S.	Europe	Emerging markets	Global
Large money center banks	0.77	1.50	0.94	0.82
Small/regional banks	0.93	0.66	0.44	0.89
Thrifts	0.71	1.25	1.01	0.99
Brokerage houses	1.20	0.67	0.96	0.81
Investment banks	1.30	NA	NA	1.30
Life insurance	1.58	1.38	0.66	1.10
Property and casualty insurance companies	0.91	1.18	0.68	0.77

Table 3: Betas for financial services businesses

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. There can be significant regulatory differences across markets, and even within a market, across different classes of financial services firms. To reflect this, we would define the sector narrowly; thus, we would look at 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 services 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 3 summarizes the betas for different groups of financial services companies, categorized by region, in January 2012.

Risk and regulation

There is one final point that bears emphasizing here. The average betas that we get across financial services 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 costs of equity for firms affected by the regulation. For instance, the crisis of 2008 caused banking regulations to be tightened globally and may very well have pushed up the betas for all banks, at least for the foreseeable future.

The research on the relationship between risk and regulation is still in its infancy and we do not have the answers to several key questions. Is regulatory uncertainty firm-specific or diversifiable

risk? Should we be incorporating it into betas and costs of equity or should we assume that investors can eliminate it in their portfolios? One way to answer these questions is to look at how the banks are priced across different regulatory regimes, comparing both across time and across countries. If, in fact, regulatory risk is a driver of the cost of equity, we should expect to see banks trade at much lower prices, relative to earnings, dividends, and book value of equity, during periods of high regulatory risk.

Expected growth and its quality

In developed markets, we have tended to think of financial services firms as mostly mature businesses, with little potential for explosive growth. That may be appropriate, given how saturated these markets are with financial product offerings, but even in developed markets, some banks find potential for high growth, either by exploiting new markets or competing for market share in existing ones. As a general proposition, it is far more likely that you will find high growth at smaller financial firms in mature markets.

In emerging markets, where access to, and use of, financial products (banking services, mutual funds) is in its infancy, it is still possible to find high growth at financial services firms, even if they are large. This is especially true in the many emerging markets that have been reluctant to open their financial services businesses to foreign competition. Ultimately, though, the common theme across all of the valuation models in the last section is that it is not the growth per se that creates value but whether that growth is accompanied by excess returns, i.e., the difference between the return on equity and the cost of equity. Financial services firms that generate returns on equity that exceed the cost of equity, we argued, will create value from growth. To value a financial services firm, therefore, it behooves us to get better assessments of the return on equity, both on existing assets and new investments.

To get a measure of how much variation there is in return on equity across banks, we looked at the distribution of return on equity for U.S. banks in November 2012 (Figure 5).

Of the 106 banks in the sample, about 70% had returns on equity that were less than the median cost of equity of 9.20% in November 2012 (based upon a risk free rate of 2%, an equity risk premium of 6%, and a beta of 1.20). It is therefore not surprising that so many banks trade at below their book value of equity.

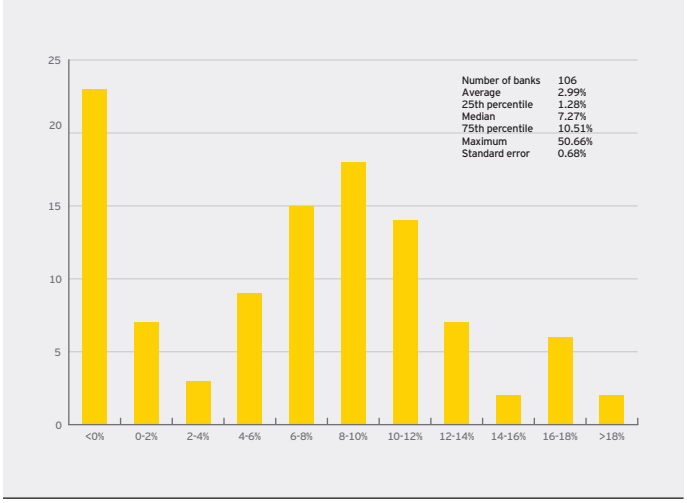

Figure 5: Return on equity at U.S. banks in November 2012

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 services firms.

Choices in multiples

Firm value multiples such as enterprise value (EV) to EBITDA or EV to EBIT cannot be easily adapted to value financial services 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 services firms, the multiples that we will work with to analyze financial services firms are equity multiples. The three most widely used equity multiples are price earnings ratios, price to book ratios, and price to sales ratios. Since sales are not really measurable for financial services firms, price to sales ratios cannot be estimated or used for these 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 services firms with higher expected growth rates in earnings, higher payout ratios, and lower costs of equity.

An issue that is specific to financial services 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 services 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 willing 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.

Price to book ratios

The price to book ratio for a financial services 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 variables, 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.

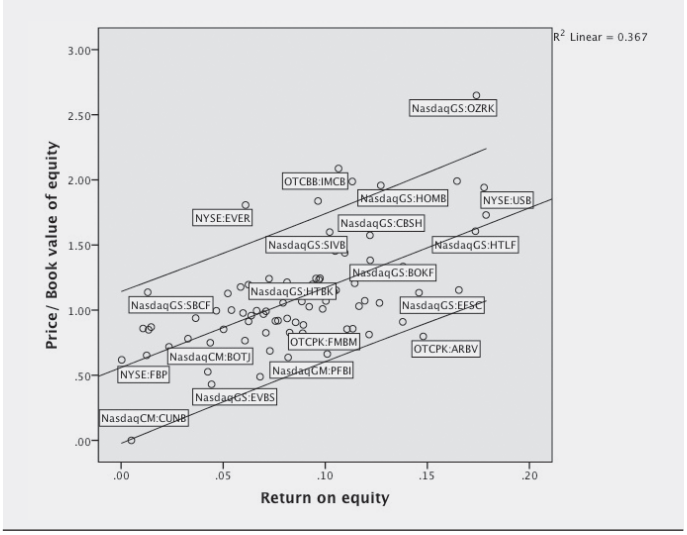

Figure 6: Price to book ratios and returns on equity: U.S. banks in November 2012
[a]Regression line, with 90% confidence range on estimate

If anything, the strength of the relationship between price to book ratios and returns on equity should be stronger for financial services 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 in the U.S. in November 2012 (Figure 6).

Note the strong link between price to book ratios and returns on equity, with the banks that earn higher returns on equity trading at much higher price to book ratios.

In fact, a key test of this relationship is to see if it holds even in the midst of a crisis. To test that proposition, we went back to February 2009 and graphed price to book ratios against returns on equity for U.S. banks with market capitalizations that exceeded a billion in Figure 7.

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

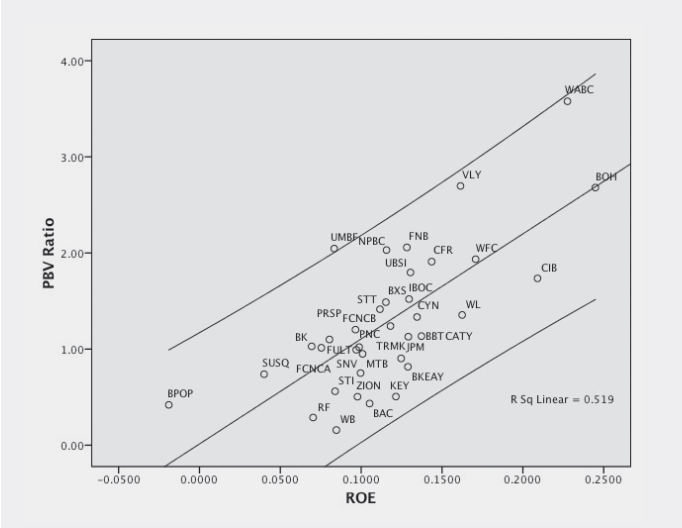

Figure 7: Price to book versus ROE for U.S. Banks: February 2009

that equity values in banks reflect the panic and irrationality, it is 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 that have high price to book ratios tend to have high returns on equity (top right corner of Figure 7), while those that have low returns on equity trade at low price to book ratios (bottom left hand corner of Figure 7). 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 even in the midst of chaos.

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 that, for any given return on equity, riskier banks should have lower price to book 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. Since the banking crisis, 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.

Conclusion

The basic principles of valuation apply just as much for financial services firms as they do for other firms. There are, however, a few aspects relating to financial services firms that can affect how they are valued. The first is that debt, for a financial services 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 services 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 cashflows, are often not observable at financial services 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 ratios better suited for comparing financial services firms than value multiples. In making these comparisons, we have to control for differences in fundamentals – risk, growth, cashflows, and loan quality – that affect value.

Finally, regulatory considerations and constraints overlay financial services firms' valuations. In some cases, regulatory restrictions on competition allow financial services firms to earn excess returns and increase value. In other cases, 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.

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