

Capital Market Driven Corporate Finance

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Abstract

Much of empirical corporate finance focuses on sources of the demand for various forms of capital, not the supply. Recently, this has changed. Supply effects of equity and credit markets can arise from a combination of three ingredients: investor tastes, limited intermediation, and corporate opportunism. Investor tastes when combined with imperfectly competitive intermediaries lead prices and interest rates to deviate from fundamental values. Opportunistic firms respond by issuing securities with high prices and investing the proceeds. A link between capital market prices and corporate finance can in principle come from either supply or demand. This framework helps to organize empirical approaches that more precisely identify and quantify supply effects through variation in one of these three ingredients. Taken as a whole, the evidence shows that shifting equity and credit market conditions play an important role in dictating corporate finance and investment.

1. INTRODUCTION

Traditional theories of corporate finance focus on how firm characteristics influence the demand for capital. These theories—tax shields, distress and debt overhang, agency problems, and asymmetric information—find convincing evidence in the cross section of industry- or firm-level corporate decisions. Airlines, to pick an example, use more debt and leases in their capital structure than do software companies. Traditional corporate finance is less convincing in explaining the time series of issuance, capital structure, payout policy, and investment. Arguing that unusually low asymmetric information facilitated equity issues in the late 1990s, that especially severe agency problems invited the leveraged buyout boom that ended in 2007, or that a contraction in the demand for credit precipitated the 2008 financial crisis seems incomplete at

best. Popular accounts of equity and credit market conditions are more plausible, and simpler, supply-driven explanations. Emerging research in corporate finance often takes this view, teasing out separate supply and demand effects.

Supply effects: the impact of nonfundamental investor demand on corporate finance

Demand effects: the impact of firm fundamentals, such as investment opportunities, taxes, financial distress costs, agency problems, and asymmetric information, on corporate finance

Demand effects are the traditional focus of corporate finance. In the trade-off theory of capital structure, debt can increase cash flows by reducing the government's share. At the same time, too much debt can lead to lower cash flows after deducting the direct costs of bankruptcy and the indirect costs of inefficient operations leading into bankruptcy. In agency and incomplete contracts theory, debt and dividends and the associated control rights of creditors and shareholders are used to discipline management, thereby increasing cash flows. Under asymmetric information theory, corporate financial decisions do not change cash flow, but they do credibly reveal what managers know about cash flows to outside investors. This process of signaling might lead firms to carry extra slack, thereby avoiding new, outside capital and the negative signal that comes with it. A common theme in all three theories is that firm characteristics dictate the nature and mix of financial contracts that maximize cash flow. In other words, firm characteristics drive demand for debt, debt maturity, equity, and hybrid securities.

Supply effects have, for the most part, received less attention. Corporate finance outcomes are still the intersection of demand and supply, but the implicit assumption in focusing on demand is that the equilibrium supply of capital is perfectly competitive and elastic at a price that reflects the fundamental value of future cash flows. With this convenient assumption of perfect competition, the interesting part of corporate finance is confined to understanding the firm characteristics that drive demand and the mix of capital that maximizes value. A by-product

of this assumption is a clean line between traditional theories of corporate finance and theories of financial intermediation and asset pricing.

Before moving on, it is worth clarifying terminology. The clean line between corporate finance and asset pricing has made the labeling of supply somewhat unclear across literatures. Corporate finance typically takes for granted a supply of capital from investors and focuses on corporate demand for debt, equity, and other securities, whereas asset pricing takes for granted a supply of securities from firms and focuses on investor demand. This makes references to supply and demand without modification unclear. I refer to investor demand and the supply of capital interchangeably, using the first in asset-pricing contexts and the second in corporate contexts.

In reality, there are as many potential supply effects as there are channels of intermediation between the ultimate suppliers of capital and the corporate users of capital. The most significant channels are banking, private and public credit markets, and private and public equity markets. There is no crisp delineation between corporate finance and asset pricing when these channels are not perfectly competitive and prices and interest rates do not reflect fundamental value.

Whether in banking or credit and equity markets, there are three drivers of supply effects: investor tastes, limited intermediation, and corporate opportunism. Investor tastes are defined broadly to include any situation where the preferences (possibly irrational) or expectations of the ultimate individual investors shift over time in a way that is unrelated to corporate fundamentals. At times, investors have ample tolerance for risk or rosier views of corporate cash flows. At other times, they do not. Limited intermediation is a broader definition of the limits to arbitrage indicating that intermediaries—banks, insurance companies, hedge funds, mutual funds, pension funds, and endowments—are not always well capitalized, competitive, and effective at forcing

prices to fundamental value. Financial institutions of all types must raise capital themselves. Just as in corporate finance, agency problems arise between managers and their ultimate investors: Institutional managers have short horizons, capital is not always available when needed, and competition is not perfect as a result.

Investor tastes: a broader notion of investor sentiment that includes any situation where the preferences or expectations of the ultimate individual investors shift over time in a way that is unrelated to corporate fundamentals

Limited intermediation: a broader notion of the limits to arbitrage that includes banks, insurance companies, hedge funds, mutual funds, pension funds, and endowments. These intermediaries are limited in that they are not always well capitalized, competitive, and effective at forcing prices to fundamental value

Corporate opportunism: the extent to which firms generate and respond to nonfundamental investor demand

These first two ingredients—investor tastes and limited intermediation—interact. For example, a crisis of investor confidence can cause an isolated panic among depositors or a full-fledged bank run. This would not affect the price of loans more broadly, provided the rest of the banking system is competitive and well capitalized. In equity markets, investor tastes will not move prices away from fundamentals if there are well-capitalized and rational intermediaries engaged in competitive arbitrage. In reality, competition among banks and other intermediaries is far from perfect at undoing the effects of investor tastes. So, limited intermediation and investor tastes combine and lead to nonfundamental movements in asset prices and interest rates.

To the extent that firms respond to these changes in the cost of capital—the final ingredient of corporate opportunism—there are supply effects in corporate finance. The literature on supply effects is much too large to accommodate in one paper, so it is worth mentioning what is and what is not covered. This review focuses on recent corporate finance research that considers the supply effects of credit and equity markets on corporate finance, with an emphasis on situations where investor tastes change over time. The capital market-driven financing

channel appears at least as far back as Keynes (1936), and the modern literature includes Fischer & Merton (1984), Morck et al. (1990), Stein (1996), and Shleifer & Vishny (2003). Baker et al. (2007b) provide a review of the literature. Unlike this earlier work, the emphasis in this review is on strategies for identifying and quantifying supply-side effects.

The review is organized as follows. Section 2 puts this paper in the context of several closely related topics: the real effects of monetary policy, law and finance and cross-country growth studies, the psychology of corporate managers, and banking. Section 3 provides a brief description of recent trends in asset pricing. Supply effects in corporate finance are inherently about understanding the pricing of corporate securities.

Section 4 develops an empirical framework for identifying supply effects. There are four approaches. The first and most common approach documents reduced form correlations between capital markets and corporate finance. These are suggestive of a supply effect but are not convincing in isolation. What makes the identification of supply effects a challenging and interesting problem is that capital market pricing may simply reflect the underlying corporate finance fundamentals and hence the demand for capital. The second approach uses instruments for nonfundamental investor demand, either from shifts in investor tastes or from shifts in financial intermediation. The third uses instruments for environments of limited intermediation. The fourth uses instruments for corporate opportunism. Section 5 provides detailed examples disproportionately from my own research using the four empirical approaches, each with additional references to the emerging literature that identifies supply effects in corporate finance. Section 6 concludes. The evidence, taken as a whole, points to an important role played by shifting equity and credit market conditions—arising from a combination of investor tastes, limited intermediation, and corporate opportunism—in dictating corporate financial decisions.

Nonfundamental investor demand: a change in the supply of capital from investors that is unrelated to corporate fundamentals; includes changes in investor tastes and shocks to intermediary capital

2. RELATED LITERATURE

The focus of this paper is the exogenous effect of equity and credit markets on corporate finance. Several closely related literatures receive less attention: the real effects of monetary policy, law and finance and cross-country growth studies, the psychology of corporate managers, and banking. To an extent, each of these topics also considers the exogenous effect of access to finance on corporate finance and investment.

Much of the research in monetary economics focuses on wage and price rigidities, rather than corporate finance. However, an important theme is the impact of monetary policy on the bank lending channel. For examples, see Bernanke & Blinder (1992), Kashyap et al. (1993), Gertler & Gilchrist (1994), and Kashyap & Stein (2000). It is conceivable that monetary policy can help smooth out investor tastes that otherwise have a strong effect on the macroeconomy, as in Schaller (2008). The central bank and government can also influence credit conditions intentionally through open market operations or unintentionally through government debt issuance, as in Greenwood & Vayanos (2008) and Greenwood et al. (2008). This adds a fourth ingredient of government intervention, not covered in this review.

Legal systems affect financial development, which in turn influences corporate finance and ultimately economic growth. For examples, see King & Levine (1993), La Porta et al. (1997, 1998), Rajan & Zingales (1998), and Wurgler (2000). In limiting the scope of this paper, I leave this out, placing the research in the category of corporate demand, along with other, more firm-specific governance mechanisms.

Managerial tastes can also create apparent supply effects. Notably, overconfident managers imagine that the cost of capital varies independently of corporate fundamentals when, in fact, it does not. For examples, see Heaton (2002), Malmendier & Tate (2005), and Malmendier et al. (2007). I also classify this within corporate demand.

Supply effects in banking have been studied extensively, perhaps because the transformation of deposits into bank loans has never been viewed as perfectly competitive. Some of this is more demand than supply. For example, one focus of banking research is the process of gathering soft information to screen small, private enterprises. For theoretical underpinnings, see Diamond (1984), Holmstrom & Tirole (1997), and Stein (2002). Many other papers examine the exogenous effects of changes in bank capital or organization on corporate finance and investment. Where there is a natural fit, I accordingly place this research into the framework of investor tastes, limited intermediation, and corporate opportunism.

3. RECENT DEVELOPMENTS IN ASSET PRICING

The theoretical separation between corporate finance and asset pricing is valid when capital markets are efficient, in the sense that they immediately reflect all public information when it is revealed. Capital is always available to firms in elastic supply at a price that reflects fundamental value. This is an incredibly convenient and reasonable first approximation.

However, the empirical facts of asset pricing have gotten in the way of such a crisp delineation between supply and demand effects in corporate finance. The supply of capital is not elastic at a price that reflects fundamental value. There are three types of studies that reveal this. The first asks whether market prices respond to investor demand for securities (or a supply of capital) that is unrelated to fundamentals. In fact, they do. See, for example, Shleifer (1986) for evidence on the S&P 500 inclusion effect or, for more recent applications, Wurgler &

Zhuravskaya (2002), Mitchell et al. (2004), and Greenwood (2005). The second asks whether securities with the same fundamentals trade at the same price. In some instances they do not. See, for example, Froot & Dabora (1999) on the pricing of twin securities, or Lamont & Thaler (2003) and Mitchell et al. (2002) on the pricing of equity carveouts. The third asks whether security returns are predictable in ways that are unrelated to risk, suggesting that investor tastes or expectations shift over time and move price away from fundamental value. In principle, they are, although the details are still debated. See, for example, Fama (1998), Shleifer (2000), Barberis & Thaler (2003), and Fama & French (2007) for perspectives on this debate. The short summary is that the supply of capital is at least somewhat inelastic and that varying investor tastes dictate the location of an upward-sloping supply curve.

On the asset-pricing side, new theories have emerged to fit the facts. As a conceptual simplification, there are two extremes: consumption-based asset pricing and behavioral finance. The first retains much of expected utility theory. A common approach is to treat investor preferences as state dependent, although there are others that involve differences in tastes across investors. This approach can fit the evidence on predictability, but it has a harder time explaining why the supply of capital is inelastic and why fundamentally identical securities trade at different prices. Proponents of consumption-based asset pricing perhaps justifiably views these as second-order anomalies. Notably, in this view of asset pricing, changes in investor tastes, broadly defined to include changes in risk aversion over time, constitutes the core of supply effects in corporate finance. See Pastor & Veronesi (2005) for an example of this approach.

Behavioral finance: the study of less than fully rational investor behavior and its impact on asset prices and corporate finance

Proponents of behavioral finance trade the elegance of expected utility theory for a more eclectic description of investor behavior rooted in experimental psychology and the agency

problems of financial intermediaries. Prices in this approach deviate from fundamentals for two reasons. Some investors are not fully rational, and so investor demand is occasionally unrelated to fundamentals. See, for example, Barberis et al. (1998) and Daniel et al. (1998) for theory and Odean (1998, 1999) for empirical evidence. Investor irrationality on its own is not enough to explain the facts. As long there are some investors or institutions that are rational and well capitalized, investor demand that is less than fully rational will have no effect on price. Well-capitalized institutions will offset demand shocks, buying or selling securities until prices again reflect fundamentals. A second key ingredient in behavioral finance is often labeled the limits to arbitrage. The complexity of financial markets and the challenge of estimating and valuing future cash flows mean that delegation is necessary and yet imperfect. Consequently, institutions and intermediaries do not always have the capital and the incentives to ensure that prices reflect fundamentals. In fact, intermediaries can even be destabilizing, moving prices even further from fundamentals. See, for example, Shleifer & Vishny (1997) and Brunnermeier & Pedersen (2005).

Limits to arbitrage: the notion that arbitrage is not effective at moving prices to fundamental value

Supply effects in behavioral finance emanate from both investor tastes and limited intermediation and can explain all three sets of asset-pricing facts. Investor demand that is unrelated to fundamentals affects prices; securities with the same fundamentals can trade at different prices, provided they are not fungible; and security returns are predictable, albeit not predictable enough to offer short-term, low-risk profits.

This richer description of asset pricing means that the supply of capital can affect corporate investment and capital structure. The traditional theories that link firm characteristics to the corporate demand for capital still apply, but shifts in the supply of capital can also have a separate effect on corporate decisions. In simple terms, firms will act opportunistically, selling

securities, borrowing, and investing more when prices and the supply of capital are high and repurchasing securities, retiring debt, and cutting operating costs and investment when prices and the supply of capital are low.

Suppose we take these new facts of asset pricing at face value—there are still two theoretical objections to following the roots of supply effects through to corporate finance. One objection is that corporate financial managers are not smart enough to be opportunistic. After all, corporate financial managers are drawn from the same pool as investment managers, and investment managers do not earn abnormal returns as a group.

The first response to this critique is that managers have better information. For example, Meulbroek (1992), Seyhun (1992), and Jenter (2005) find that managers seem to time their own trades well. Managers can also actively create an information advantage through activities like earnings management.

The second response to this critique asserts that corporate managers are less constrained than their investment management counterparts. For example, they have longer horizons. Although they are evaluated on their operating performance quarterly, managers are not explicitly judged on their financing decisions. Also, they are natural short sellers of their own overvalued stocks, with no risk of having to cover a short position at a loss or meet a margin call. The third response, by Baker & Stein (2004), allows that corporate managers follow intuitive rules of thumb, such as issuing stock when it is particularly liquid, that have the unintended effect of opportunism.

The other theoretical objection to supply effects in corporate finance takes a position at the opposite extreme. Rather than lacking smarts, corporate financial managers are so opportunistic that on the margin supply effects are again irrelevant. This is a Miller (1977)

equilibrium. If some investors prefer dividend-paying stocks, firms will supply dividends up to the point that the prices of dividend-paying and -nonpaying stocks are equal, making dividend policy irrelevant again at the margin. In rejoinder, it can be said that corporate managers are opportunistic, but not to this extent. Uncertainty about investor demand and the cost, in terms of the operations of the firm stemming from financial decisions, puts limits on how actively corporate managers respond to capital market conditions.

Recent developments in asset pricing—combined with opportunistic managers—suggest a set of empirical strategies for finding supply effects in corporate finance. The supply of capital varies independently from corporate fundamentals because of shifts in investor tastes and limited intermediation. Limited intermediation means that investor tastes can filter through to the ultimate prices of corporate securities and, if there is corporate opportunism, to corporate finance.

4. SUPPLY-SIDE CORPORATE FINANCE: A FRAMEWORK

Current research in asset pricing suggests that the prices of securities vary for reasons other than corporate fundamentals. The central empirical question then is whether these supply-side shifts in price matter for corporate finance. Stein (1996) and Baker et al. (2003b) develop more elaborate frameworks for supply-side corporate finance. Here, I assume that the supply of capital from investors Q^S , or equivalently investor demand for securities, depends on the difference between fundamentals ϕ and prices P :

$$Q^S = (\phi - P)K + [(\phi + \delta) - P]k. \quad (1)$$

The traditional assumption in corporate finance is that rational intermediary capital K is large, and large relative to the capital that is subject to investor tastes k . Put another way, competitive intermediaries force prices to fundamentals through arbitrage in capital markets or through

product market competition in banking. In more realistic markets, however, investor tastes δ in the context of limited intermediation ($K < \infty$) can force price away from fundamental value. In a more elaborate model, intermediaries may also be subject to tastes, and competition need not force prices toward fundamentals. See, for example, Stein (2009). These subtleties only serve to reinforce the basic points arguments advanced here.

Managerial objectives dictate the demand Q^D for the capital supplied in Equation 1. Rather than explicitly deriving a first-order condition, I focus on a simple, linear demand function. Although this approach succeeds in saving space, it does have limitations. For example, managers have two objectives in Baker et al. (2007b): market timing and catering. The discussion here is disproportionately about market timing—the most direct notion of supply effects—but it could be adapted to include catering incentives as well.

Typically, demand is thought to be increasing ($c > 0$) in fundamentals ϕ . A firm with valuable investment opportunities is worth more and also requires more capital for new investment. Capital market prices are generally positively and significantly correlated with corporate issuance and investment. The concern arises that this reflects underlying fundamentals rather than supply effects. If demand were decreasing ($c < 0$) in fundamentals, the null hypothesis of no supply effects would be much easier to reject.

Demand is also increasing ($b > 0$) in the difference between price P and fundamental value ϕ , or equivalently decreasing in interest rates. As long as the manager is an owner and presuming, as described above, that the manager has the ability to be opportunistic, he will prefer not to sell claims on the firm's cash flows at low prices. This effect can vary across firms. For example, financially constrained firms may be better able to take advantage of overvaluation. A

profitable and unconstrained firm might have difficulty issuing overvalued equity because it has no credible need for new external finance. So, demand is

$$Q^D = a + b(P - \phi) + c\phi. \quad (2)$$

In traditional corporate finance, there is no investor sentiment; δ is zero. Or, if there is, it is undone by competitive intermediaries, with an elastic supply of capital; $K \rightarrow \infty$. The second term in Equation 2 drops out, and there are no supply effects. Fundamentals uniquely determine the quantity of corporate capital $Q = a + c\phi$, and corporate finance can safely ignore asset pricing. In reality, investor tastes combine with limited intermediation to affect prices, and supply is not perfectly elastic:

$$P = \phi + \frac{k}{K+k}\delta - \frac{1}{K+k}Q^S. \quad (3)$$

So, in equilibrium, there are reduced form supply effects in corporate finance:

$$Q = a' + b'\frac{k}{K+k}\delta + c'\phi, \text{ where } x' = x\frac{K+k}{K+k+b}. \quad (4)$$

The supply of capital matters through a combination of investor tastes δ , limited intermediation $\frac{k}{K+k}$, and corporate opportunism b .

Roughly speaking, there are four approaches to identifying supply effects, or testing whether $b > 0$:

1. Correlations between capital markets and corporate finance. The first approach is simply to look at correlations between market prices and corporate financial decisions. Although this is a reasonable starting point, it is equally likely that market prices and interest rates merely reflect underlying fundamentals, and so a positive correlation could be coming from a situation where $b = 0$ and $c > 0$.
2. Nonfundamental investor demand. The second approach is to identify supply effects with shifts in investor demand. This can be either changes in investor tastes δ or shocks to capital K . Staying in the context of Equation 4, the effect of shocks to K can only be clearly signed when sentiment is negative ($\delta < 0$), for example where individuals are not active participants. There are obviously many more interesting nuances in banking. However, I put most of the large literature on the supply effects of the banking channel here, as shocks to K .
3. Limited intermediation. The third approach is to identify supply effects with shifts in limited intermediation $\frac{k}{K+k}$. Limited competition among intermediaries leads to larger gaps between prices and fundamental value, either positive or negative. A greater sensitivity of corporate finance to market prices and interest rates in these situations suggests supply effects.

4. Corporate opportunism. The fourth approach is to identify supply effects with shifts in corporate opportunism b . This recognizes that there are interactions between the capital market conditions that drive supply and the firm characteristics that drive demand.

The balance of this section details the theoretical framework used to describe the four supply effects identified above.

4.1. Correlations Between Capital Markets and Corporate Finance

The first approach is to test for a positive correlation between market prices and corporate decisions. For equity market effects, valuation ratios and past returns are common proxies for market pricing. For credit markets, interest rates and interest rate spreads are often used.

The critical idea is that part of a valuation ratio, such as the ratio of the market value of assets to its book value contains the reduced form impact of investor tastes. If book value serves as a rough measure of fundamentals, a high market-to-book is consistent with positive sentiment. Prior research does suggest that market-to-book includes a component that is unrelated to longer run value. For example, see Basu (1983), Fama & French (1992), Kothari & Shanken (1997), and Pontiff & Schall (1998)). La Porta (1996), La Porta et al. et al. (1997), and Frankel & Lee (1998) connect these patterns to errors in investor expectations.

This suggests empirical models of the following form:

$$Q_i = \hat{a} + \hat{b} \frac{M}{B}_i + u_i, \quad (5)$$

where i denotes the firm and Q is the observed corporate quantity of finance or investment. Of course, a positive and significant coefficient does not prove that $b > 0$, because the market-to-book ratio also includes fundamentals,

$$\frac{M}{B} = d + \frac{k}{K+k} \delta + \phi, \quad (6)$$

where the coefficients on $\frac{k}{K+k}\delta$ and ϕ are set to be one, there is no measurement error, and the market-to-book ratio is linear in investor tastes and fundamentals, all to keep the notation simple. Although the market-to-book ratio may be a good proxy for δ , it is also a good proxy for many other fundamental variables that drive corporate finance decisions, notably future cash flows, agency problems, and asymmetric information, and these fundamentals may be correlated with the stock market. As a result, an upward-biased estimator of b emerges provided that c is greater than b .

A standard approach is to control for the effect of ϕ directly, by including additional independent variables that are correlated with fundamentals ϕ but uncorrelated with investor tastes δ . The adequacy of this approach depends on the valuation ratio and its correlation with the fundamentals driving a particular corporate decision. Another option is to develop a more elaborate and more accurate measure of fundamentals than book value. See, for example, Dong et al. (2006) or Chirinko & Schaller (2001).

For some sets of corporate decisions, this is a reasonable approach for understanding supply effects. For example, with dividend policy, the valuation ratio of interest is the difference between the market-to-book ratios of dividend payers and nonpayers. There is no traditional, demand-driven theory that predicts a relationship between the relative valuation of payers and nonpayers and dividend initiation. Also, we can include what are arguably better firm-level controls for investment opportunities.

For other corporate decisions, controlling for fundamentals is more challenging. For example, investment is intimately related to the market-to-book ratio. If the market value of assets exceeds its replacement cost, investment logically rises. Thus, it is hardly surprising that

there is a positive relationship between the two, even in traditional, demand-driven corporate finance. No set of controls can eliminate the concern that residual omitted variable bias (and hence fundamentals) are driving investment. Here, more creativity is required to identify a clear supply-side effect.

4.2. Nonfundamental Investor Demand

The first approach to addressing omitted variable bias is to instrument for nonfundamental investor demand. The idea is to find empirical measures that are correlated with sentiment δ or shocks to capital K , but not with fundamentals. This is simple enough to write but hard to implement. If it were possible to identify mispricing so clearly, such mispricing might not arise in the first place.

One strategy is an extension of the first approach. Realized, future returns may be a cleaner proxy for ex ante, nonfundamental movements in prices. This is still a reduced form strategy that does not use the root cause of investor demand. Two other strategies are to use either psychology or shocks to the capital of financial institutions to identify nonfundamental investor demand.

4.2.1. Future returns.

A common approach is to use future returns. If stock prices routinely decline after a corporate decision, then inflated prices may have played a role in the decision. In other words, a component of returns is the correction of ex ante sentiment:

$$R^{t+1} = e + f \frac{K-k}{K} \delta + \varepsilon_R, (7)$$

where R^{t+1} is the future return and high sentiment is associated with lower future returns, so $f < 0$. Most of the return over any given period comes from revisions in expectations about fundamentals and revisions in sentiment, and so it is unpredictable even with ex ante knowledge

of sentiment. The key assumption needed for R^{t+1} to be a valid instrument is that future returns are uncorrelated with ex ante fundamentals, $\text{corr}(\varepsilon_R, \phi) = 0$. For example, correcting returns for an asset-pricing model such as the capital asset pricing model (CAPM) may help. With this assumption, we can either instrument for ex ante valuation ratios such as the market-to-book ratio to obtain an unbiased estimate of b in Equation 5 or create portfolio strategies inspired by $b > 0$ in Equation 4.

Returns are perhaps less contaminated by fundamentals than is the market-to-book ratio. However, this approach is still subject to two theoretical concerns. The first is the joint hypothesis problem. Using corporate decisions to predict future returns might mean there was misvaluation ex ante driving these decisions or simply that the definition of a normal CAPM expected return is wrong. The corporate event may simply coincide with changes in risk, for example, without any causality. The second concern is that investors have a tendency to overprice firms that have genuinely strong fundamentals. If so, even issuance and investment decisions, for example, which are followed by low returns need not be ex ante inefficient. In both cases, corporate decisions are correlated with future returns, but future returns are not a valid instrument, because $\text{corr}(\varepsilon_R, \phi) \neq 0$: Investment may be responding to fundamentals and not mispricing.

4.2.2. Investor tastes.

Another approach to identifying nonfundamental demand is to use theories of investor psychology. Using valuation ratios, or even future returns, still relies on a reduced form mispricing $\frac{k}{K+k} \delta$, without clearly identifying its source δ . Using measures of investor psychology that are more naturally correlated with investor sentiment and uncorrelated with fundamentals is an appealing alternative. Provided there is limited intermediation $\frac{k}{K+k} > 0$, then

any shock to investor tastes will affect prices and interest rates, and hence corporate finance.

Unfortunately, such connections are generally hard to identify because of the separation between individual investor decision making and capital market prices—and ultimately corporate finance.

There are two cases where investor tastes can be linked to non-fundamental demand. The first and simpler case is when the sign of δ is clear. For example, I argue that investor inertia can lead to extra demand δ for the acquirer and higher prices in the context of stock-financed mergers and acquisitions. The second is when the sign of δ is unclear. For example individual investor overconfidence leads to more extreme beliefs, not necessarily more optimistic beliefs. Still, this can be connected to non-fundamental demand. A typical assumption is that investors can purchase undervalued securities, but they cannot as easily sell overvalued ones. An increase in overconfidence is equivalent to a higher δ in this case because only optimists affect prices in the presence of short sales constraints.

In either case, we can use measures of investor tastes to instrument for mispricing, just as in Equation 7. The key assumption again is that such proxies are not otherwise related to corporate fundamentals, or $\text{corr}(\varepsilon, \phi) = 0$.

4.2.3. Shocks to intermediary capital.

A final, more common approach to identifying nonfundamental demand is to use shocks to intermediary capital. If prices are set according to Equation 1, the effect of shocks to intermediary capital K is ambiguous. If δ is negative, increasing K increases overall demand. If δ is positive, increasing K actually reduces overall demand, as intermediaries offset individual investor demand.

There are two cases that mirror shocks to investor tastes. The first is when individual investors are limited participants in the supply of capital. For example, individuals are unlikely to substitute for bank loans. Also, short sales in this market are uncommon, with the exception of the recent growth in the market for credit insurance. As a result, an increase in bank capital likely increases prices and reduces interest rates. The second is when the shock to intermediary capital is asymmetric. For example, relaxing a short sales constraint can only reduce prices or raise interest rates, and relaxing a leverage constraint can only increase prices or reduce interest rates.

In either case, we can use intermediary capital to instrument for mispricing, just as in Equation 7, provided that the change in intermediary capital is not otherwise related to corporate fundamentals, or $\text{corr}(\varepsilon, \phi) = 0$. The next subsection considers the more complicated case, where the sign of investor tastes is unclear and the shock to intermediary capital is symmetric.

4.3. Limited Intermediation

The third approach is to instrument for limited intermediation. The idea is to find situations where investor tastes are likely to have a stronger effect on prices and hence corporate financial decisions.

Without a specific sign on investor tastes δ , limited intermediation can cause prices to rise or fall. If sentiment is negative, then limited intermediation increases prices. If sentiment is positive, then limited intermediation reduces prices. Here, there is still some hope of identifying a supply effect. Limited intermediation does not define the level of mispricing relative to fundamentals, but it does help determine the scope of mispricing.

Staying with the market-to-book example, we substitute Equation 6 into Equation 4 to get a clear view of the omitted variable bias. In particular, replacing ϕ and adding an error term to Equation 4 gives

$$Q = (a' - c'd) + c' \frac{M}{B} + (b' - c') \frac{k}{K+k} \delta + \varepsilon_Q, \quad (8)$$

where ε_Q is the part of the corporate decision that is not explained by fundamentals or supply effects. This shows the omitted variable bias in Equation 5. In running a simple regression of the corporate quantity on the market-to-book ratio, the estimate of b will be

$$\hat{b} = c' + (b' - c') \frac{\left(\frac{k}{K+k}\right)^2 \sigma_\delta}{\left(\frac{k}{K+k}\right)^2 \sigma_\delta + \sigma_\phi}, \quad (9)$$

where σ_δ and σ_ϕ are the variance of investor tastes and fundamentals, respectively. If there are no supply effects ($b = 0$), then the coefficient is a downward-biased estimate of c , with the bias coming from the fact that the market-to-book ratio measures fundamentals with error. If there are supply effects, then the coefficient estimate is increasing in the extent of limited intermediation $\frac{k}{K+k}$, provided b is greater than c .

This suggests the strategy of interacting a proxy for limited financial intermediation with measures of mispricing like the market-to-book ratio. Equation 5 can be modified as follows:

$$Q_i = \hat{a} + \left(\hat{b}L + \hat{c}\right) \frac{M}{B}_i + u_i, \quad \text{where } L = \frac{\left(\frac{k}{K+k}\right)^2 \sigma_\delta}{\left(\frac{k}{K+k}\right)^2 \sigma_\delta + \sigma_\phi} + \varepsilon_L \quad (10)$$

and is a measure of limited financial intermediation. The coefficient on the interaction with the market-to-book ratio delivers an estimate of $b - c$, and the direct effect is an estimate of c . So if the coefficient on the interaction term is greater than zero, one can infer that a unit change in the mispricing component of market to book has a greater impact than does a unit change in the fundamentals component.

In sum, proxies for limited intermediation can be used in two ways. First, they can directly identify supply effects, when investor sentiment can clearly be signed or the shock to intermediary capital is asymmetric. Second, they can be interacted with proxies for mispricing.

4.4. Corporate Opportunism

The fourth approach recognizes that not all firms are created equal in terms of their ability to be opportunistic in capital markets. Even if we take as given that investor tastes and limited intermediation combine to affect prices and interest rates, there is only an effect on corporate finance if firms respond. Some firms may be unable to respond to prices, so that $b = 0$ in Equation 2. Others firms may be quite sensitive to prices.

Sometimes there are asymmetries, as in the example of financial constraints. On the one hand, a constrained firm is able to be more opportunistic in raising and investing new and overvalued capital and is forced to cut investment when the cost of new capital is high. An unconstrained firm would have more difficulty making the case to sell new securities. On the other hand, an unconstrained firm can be more opportunistic in repurchasing and retiring existing and undervalued capital and can insulate investment from market downturns.

Instead of an instrument for reduced form mispricing, then, as in Equation 7, an instrument for opportunism is required. This proxy needs to be interacted with measures of capital market prices or mispricing. The identification works properly if the interaction term is otherwise uncorrelated with corporate fundamentals; for instance, $\text{corr}(X = b\delta + \varepsilon_X, \phi) = 0$.

5. SUPPLY-SIDE CORPORATE FINANCE: EVIDENCE

Three ingredients can lead to the possibility of supply effects in corporate finance. Investor tastes and limited financial intermediation can combine to move prices away from fundamental values. Also, corporate managers have the means and the incentive to be opportunistic, responding to

and even creating opportunities to raise and invest capital at low cost. Whether this possibility is an important reality is an empirical question.

These three ingredients together suggest a variety of paths to empirical testing, starting with simple correlations between capital market pricing and corporate finance. More subtle approaches involve using proxies and instruments for (a) nonfundamental demand, including investor tastes and shocks to intermediary capital, (b) limited intermediation, which can exacerbate deviations from fundamental value, and (c) corporate opportunism.

Anecdotal evidence from surveys of managers suggests that this possibility ought to be taken seriously. For example, Graham & Harvey (2001) find that CFOs endorse the following statements: “The amount by which our stock is undervalued or overvalued was an important or very important consideration” in issuing equity; “If our stock price has recently risen, the price at which we can sell is ‘high’”; and short-term debt is preferred “when short-term interest rates are low compared to long-term rates” and when “waiting for long-term interest rates to decline.” Further, market histories, such as Malkiel (1990), Kindleberger (2000), and Ofek & Richardson (2003) on the Internet, contain colorful examples of capital markets affecting real activity.

5.1. Correlations Between Capital Markets and Corporate Finance

The simplest approach one can take is to examine the correlation between corporate financial decisions and capital market prices and interest rates. If there were no statistical relationship with corporate finance, it would be hard to claim supply effects were important.

The strongest evidence is in issuing and repurchasing equity. Taggart (1977), Marsh (1982), Asquith & Mullins (1986), Korajczyk et al. (1991), Jung et al. (1996), and Hovakimian et al. (2001) find that seasoned equity issues follow high valuations. Loughran et al. (1994) and Pagano et al. (1998) find the same in initial public offerings. And, Ikenberry et al. (1995) find

just the opposite for repurchases. Dong et al. (2006), Bouwman et al. (2009), Ang & Cheng (2006), and Rhodes-Kropf et al. (2005) link valuation levels and merger activity.

Strong patterns are also apparent in debt issues. Taggart (1977) and Marsh (1982) find that debt issues respond to the level of interest rates. Barclay & Smith (1995), Guedes & Opler (1996), and Stohs & Mauer (1996) find a connection between the maturity structure of debt issues and the spread between long and short bond yields. There is some debate over the persistence of these effects, with Baker & Wurgler (2002), Huang & Ritter (2008), and Chen & Zhao (2005) arguing that there is a long-term effect on capital structure, and Leary & Roberts (2005), Alti (2006), and Kayhan & Titman (2007) claiming less persistence.

The new equity and debt, if not used in the context of a merger, appear to be used for investment. However, here is where the problem of interpretation appears most clearly. The traditional interpretation from Tobin's Q -theory (1969) and from von Furstenberg (1977) is that market prices reflect the present value of future investment opportunities. The link between capital markets and corporate finance is statistically valid, but it may not reflect supply-side effects. More recent incarnations include Berk et al. (1999), Carlson et al. (2005, 2006), and Lyandres et al. (2008). They claim that investment opportunities and the exercise of investment options affect asset prices, not the other way around. This makes identifying supply effects through simple correlations difficult.

There is perhaps one exception. Not all corporate decisions are as tightly linked to growth opportunities, and hence market valuations, in traditional, demand-driven corporate finance theory. For example, Cooper et al. (2001) find that firms change their names in an attempt to cater to prevailing investor tastes.

Dividends and stock splits follow a similar pattern. Baker & Wurgler (2004) correlate the propensity to pay dividends with four proxies for a so-called dividend premium in stock prices, including the difference between the average market-to-book ratio of dividend payers and nonpayers. Both dividend initiations and omissions are connected to these price variables. Li & Lie (2006) and Ferris et al. (2006) find similar results for dividend changes and in U.K. data, respectively. However, Denis & Osobov (2005) find that the effects do not extend to all other developed countries. More recently, Baker et al. (2009b) find that firms are more likely to split their shares when a similar premium on small or low-priced stocks is high.

Unlike with direct investment, it is harder to explain these particular correlations between market prices and corporate decisions. There are fewer compelling reasons that the valuations of Internet stocks, dividend payers, or low-priced stocks might influence the choice of firm name, the initiation of a dividend, or the decision to split. This is in part because these decisions are not as well understood in traditional theory. There is a spectrum, then, from corporate name changes to investment. At one end, the case for supply effects is cleaner, but the economic importance of the decision is modest. At the other end, the case for supply effects is muddier, but the economic importance, if it is there, is unquestionable. This is reminiscent of clear violations of the law of one price in the pricing of Palm and 3-Com in Lamont & Thaler (2003). These are either the tip of the iceberg of market inefficiency or a curiosity in an otherwise efficient market.

Market efficiency: the extent to which prices reflect fundamental value. An efficient market is one in which prices reflect all publicly available information

5.2. Nonfundamental Investor Demand

Valuation ratios are contaminated by fundamentals. One remedy is to move closer to the root cause of supply effects: nonfundamental investor demand. Investor demand can be measured in

three ways. The first is its reduced form impact on prices, measured with future returns. The second is shocks to intermediary capital. The third is investor tastes.

5.2.1. Future returns.

If nonfundamental investor demand pushes prices up, future returns must be lower as fundamentals are revealed. This is not too far removed from the basic correlations between valuation ratios and corporate finance, but there is an important distinction. Valuation ratios include information about expected cash flows, whereas future returns do not in efficient markets.

For each empirical pattern in valuation ratios, there is a corresponding pattern in returns, both in the time series of market-level returns and in the cross section of firm returns. For example, equity issuers have low subsequent returns in Stigler (1964), Ritter (1991), Loughran & Ritter (1995) and many recent papers. Repurchasers have high returns in Ikenberry et al. (1995). Jenter et al. (2006) find that corporate put option sales on their own stock are also timed well. Loughran & Vijh (1997) and Savor & Lu (2009) find similar patterns for stock acquirers. Baker et al. (2003a) find return predictability in bond maturity choice, and patterns are also apparent in corporate hedging choices in Brown et al. (2006) and Faulkender (2005). Henderson et al. (2005) examine international data. These financing choices flow through to investment overall, which also predicts returns in Titman et al. (2004) and Polk & Sapienza (2009). Frazzini and Lamont (2008) connect corporate issuance to mutual fund flows. Corporations, not arbitrageurs, appear to accommodate this supply of “dumb” money.

There are statistical concerns raised by Fama (1998) and Mitchell & Stafford (2000). Buy-and-hold returns are clustered by industry and are not normally distributed. Calendar-time portfolios are an improvement, but the changing composition of these portfolios adds another

complication to standard tests. Analyzing aggregate time series resolves many of these problems, but short histories can mean lower power and the Stambaugh (1999) bias, as well. There are, at least, established techniques to deal with small-sample biases.

Perhaps more importantly, although returns do not reflect differences in expected cash flows, they can capture another part of corporate fundamentals: risk. Eckbo et al. (2000) interpret the firm-level results as reflecting the low risk of equity issuers. Typically, though, a version of the CAPM should hold under risk interpretations. The evidence in Lewellen & Nagel (2006) suggests that a conditional version of the CAPM would have a hard time explaining the evidence on corporate decisions and future returns. The economic magnitudes are also high, and the predicted returns are occasionally negative, suggesting perhaps implausible variation in risk aversion.

At the very least, a wide range of evidence on stock returns is consistent with supply effects. Firms raise capital when it is cheap, in the sense of delivering a lower future return. Whether this is corporate opportunism, compensation for risk, or simply good luck is harder to prove beyond doubt.

5.2.2. Investor tastes.

Valuation levels and even returns can be contaminated with corporate fundamentals. So, the fact that valuation levels and many corporate decisions are positively correlated and that future returns and the same corporate decisions are negatively correlated is not enough to be certain that supply effects are important in corporate finance. The next step is to attempt to identify the source of market pricing, bearing in mind that investor demand comes from two places: individuals and institutions.

Evidence from the lab suggests that individuals make systematic mistakes in forming expectations and making choices. Connecting corporate finance to these mistakes would clearly suggest a supply effect. The challenge is connecting individual biases to pricing anomalies. The interaction among investors and institutions in capital markets is often too complicated to neatly summarize with even a set of well-documented biases and heuristics from, for example, Tversky & Kahneman (2000).

A bias toward inertia shows some promise, as in Baker et al. (2007a), because it makes fairly precise predictions about pricing and the likely response of corporate managers. Inertial behavior can arise from endowment effects (Thaler 1980; Kahneman et al. 1990, 1991), procrastination (Akerlof 1991, O'Donoghue & Rabin 1999), and cognitive fixed costs.

A specific application of inertia in corporate finance is raising capital via stock-swap merger and raising capital via direct equity offering. These two means of issuing equity present different default options. Investors in the target firm must opt out of a stock swap merger to avoid implicitly buying shares in the acquirer, whereas investors must opt in explicitly to participate in a seasoned equity offering. Baker et al. (2007a) develop a proxy for inertia using nonoverlapping institutional ownership and find both price impacts and a corporate response. The price impact of raising equity in the context of a merger falls with the inertia of the target shareholder base. Also, firms are more likely to use stock as a result. Zhang (2004) argues that the same sort of inertia, stemming from endowment effects, can help to explain IPO underpricing.

There are other examples of this approach, where firms react to investor tastes in the release of information, dividends, corporate finance, and investment. First, firms respond to investor inattention by timing the release of bad news on Fridays (DellaVigna & Pollet 2009).

Second, the preference for dividends by senior citizens combined with a home bias in stock selection can influence corporate financial decision making. Firms respond to a local demand for dividends, measured with local demographics (Becker et al. 2007). Third, investors underreact to less salient but highly predictable information about demographic changes in demand. Firms respond by timing their financing and investment accordingly (DellaVigna & Pollet 2007). Fourth, in the presence of short sales constraints, overconfident investors have a positive impact on price, as in Diether et al. (2002) and Jones & Lamont (2002). Firms respond by raising capital and investing, as in Gilchrist et al. (2005) and Panageas (2004). The challenge is finding convincing and clean empirical measures of investor tastes that influence market prices and corporate finance.

5.2.3. Shocks to intermediary capital.

After examining investor tastes, the next place to look for supply effects in corporate finance is shocks to the capital of financial intermediaries—banks, insurance companies, hedge funds, mutual funds, pension funds, and endowments. There is a large literature documenting supply effects on small enterprises through the banking channel. For two examples, see Petersen & Rajan (2002), who use distance as an instrument, and Khwaja & Mian (2008), who use variation in capital shocks across banks and trace the impact on firms borrowing from multiple banks.

More surprisingly, there are effects in larger firms and markets. Much of this work is in credit markets and banking. Chava & Roberts (2008) use the discontinuity of covenant violations to identify the effect of the supply of loans on investment. Faulkender & Petersen (2006) find that access to bond markets affects leverage. Lemmon & Roberts (2009) and Leary (2009) use the collapse of Drexel Burnham Lambert and the emergence of bank certificates of deposit, respectively, as exogenous shocks to the supply of high-yield bonds and bank loans, and find a

supply effect on investment and financial structure. Ivashina & Sun (2008) measure institutional demand by the number of days required to sell a loan, and they find a material effect on spreads and loan volume. Massa et al. (2007) examine the effect of the uncertainty, rather than the level, of the supply of bonds on financing choices. In equity markets, Massa et al. (2005) use inclusion in the Standard & Poor's (S&P) 500 to estimate the effect of the supply of equity on issuance and investment.

A recent focus has been securitization's impact on bond and loan spreads. Keys et al. (2009), Piskorski et al. (2008), and Mian & Sufi (2009) find that the source of capital—in this case, the securitized loan market—changed the extent of and the nature of screening, renegotiation, and volume of loans. Although these papers focus on residential mortgages, the effects were arguably felt in other areas, such as leveraged loans. Axelson et al. (2009) argue that credit market conditions are an important driver of private equity financing and valuations.

5.3. Limited Intermediation

Nonfundamental demand only causes prices to change in the presence of limited intermediation. The next approach to identifying supply effects takes advantage of this fact. In capital markets, limited intermediation means limits to arbitrage. In situations where acting on mispricing is limited by short-sales constraints, transaction costs, margin requirements, regulation, and fundamental risk, prices are likely to be further from fundamental value, making supply effects more likely.

In countries with limits on cross-border investment, prices are likely to be further from fundamentals. Baker et al. (2009a) examine the impact on cross-border investment. Consistent with supply effects, they find that outbound foreign direct investment flows depend on valuations, measured both with market-to-book ratios and future returns, in the source country.

More definitively, these patterns are strongest in the presence of capital controls—particularly controls that inhibit other types of cross-country arbitrage, such as capital and money market restrictions.

In a similar vein, Lamont & Stein (2006) use the differential sensitivity of equity issuance and merger activity to market versus firm-level stock returns. The central idea is that absolute levels of market prices have a higher degree of mispricing than do relative firm prices. There are also interactions with corporate opportunism. For example, according to Greenwood (2009), Japanese stock splits have the effect of reducing the number of tradeable shares and increasing prices. Firms responded with a wave of splits designed to increase prices. Larrain (2008) takes a different approach, arguing that the limits to arbitrage and a large stock of outstanding equity reduce equity issuance, because issuing firms worry about the incremental price impact of expanding the quantity of shares outstanding.

More generically, asset-pricing anomalies, including those connected to corporate finance decisions, are more pronounced in smaller and less liquid firms where the limits to arbitrage are greater. On the one hand, this suggests that these effects are less economically important because they have a smaller impact on the largest firms in the economy. On the other hand, this is exactly consistent with supply effects. The shares of small-capitalization firms are harder to borrow for short selling and involve higher transaction costs and fundamental risk.

5.4. Corporate Opportunism

A final approach to identifying supply effects is through corporate opportunism. Even if there is a combination of investor tastes and limited intermediation that affects capital market prices and interest rates, there are no supply effects unless firms respond. This observation suggests a final

set of tests. Supply effects should be most pronounced among those firms exhibiting the means and the incentive to be opportunistic.

Baker et al. (2003b) use the observation that firms that are in need of external equity finance will be forced to be opportunistic—raising capital and investing it when the cost of capital is low and forgoing investment when the cost is high. Consistent with this intuition, firms that are financially constrained have higher coefficients in regressions of investment on market-to-book ratios.

Some managers also have more incentive to be opportunistic. For example, Bergstresser & Philippon (2006) show that earnings management is more pronounced when managers are compensated with stock and options. In rights issues (versus firm commitment offerings) of new stock, by contrast, managers have less incentive to be opportunistic. This shows up in their behavior (Burch et al. 2004). Opportunism and earnings manipulation can interact. For example, earnings management through pension fund assumptions is more common prior to mergers and acquisitions (Bergstresser et al. 2006), and firms actively market their stock in anticipation of an equity offering to flatten their demand curve (Gao & Ritter 2008). A more subtle supply effect (Gaspar et al. 2005) shows that managers can inherit their investors' incentives, which may not be chosen optimally to match firm fundamentals.

6. CONCLUSIONS

Traditional theories of corporate finance focus on how firm characteristics determine the demand for capital, with less attention given to the supply. Increasingly, research has focused on how banking, private and public credit markets, and private and public equity markets have a direct and independent effect on corporate finance.

In this paper, I organize empirical approaches for identifying supply effects through a simple framework. Supply effects arise from a combination of three ingredients: investor tastes, limited intermediation, and corporate opportunism. Prices can deviate from fundamental value, when investor tastes—preferences and expectations that shift independently of firm fundamentals—combine with imperfectly competitive intermediaries. Firms raise and invest capital when prices are high and interest rates are low and repurchase equity, retire debt, and cut investment when prices are low and interest rates are high. Taken together, the three ingredients lead to supply effects.

This is not an entirely new subject of inquiry. The supply channel for corporate finance and investment has been emphasized at least since Keynes (1936) and has renewed salience in the context of the credit crisis of 2008. However, academic corporate finance since Modigliani & Miller (1958) has often retained the assumption of efficient markets, with an elastic supply of capital available to firms at a price equal to fundamental value. In this view, a financial meltdown is just a barometer for underlying corporate profits. In the market-driven view, it is finance itself that can cause a change in economic activity through its impact on corporate decisions. Recently, this channel has received the equal attention it deserves in the empirical literature on corporate finance.

Summary Points

1. Supply effects arise from a combination of investor tastes, limited intermediation, and corporate opportunism. Investor tastes combined with limited intermediation move capital market prices and interest rates away from fundamental values, and corporations respond opportunistically by issuing securities and investing at high prices and repurchasing and retiring securities at low prices.
2. Corporate managers can be opportunistic in capital markets because they have better information; because they can create an information advantage through earnings management; because they do not face some of the constraints of investment managers, such as costly short selling; and because they follow opportunistic rules of thumb. Corporate managers are not so opportunistic that they eliminate mispricing entirely, in a Miller (1977) equilibrium.

3. Investor tastes, limited intermediation, and corporate opportunism can be used to empirically identify supply effects. The key is to find data that are correlated with one of these three features of supply effects and otherwise unrelated to corporate fundamentals.
4. Nonfundamental investor demand includes changes in investor tastes and shocks to intermediary capital and is often measured empirically using future returns, investor tastes, and shocks to intermediary capital.
5. Examples of instruments for shocks to intermediary capital include geographic distance; the collapse of Drexel, Burnham, and Lambert; the emergence of bank certificates of deposit; inclusion in the S&P 500; and changes in the process of securitization.
6. Examples of instruments for investor tastes that affect corporate finance include investor inertia, inattention, home bias, and overconfidence.
7. Examples of instruments for limited intermediation include short sales constraints, firm size, market versus firm-level pricing, and restrictions on portfolio flows across borders.
8. Examples of instruments for corporate opportunism include financial constraints, stock-based compensation, and shareholder composition.

Future Issues

1. How important quantitatively are supply effects in corporate finance?
2. Can financial intermediation and security design be understood as market-driven corporate finance, matching corporate needs to investor tastes? What are the agency problems?
3. How have changes in mutual funds, hedge funds, and shareholder activism affected corporate finance? To what extent are these supply effects or changes in the fundamentals and governance of firms?
4. What are the normative, legal, and ethical implications of market-driven corporate finance? Should managers be encouraged to respond to movements in prices and interest rates that do not reflect underlying fundamentals? Jensen (2005) explores the agency problems that arise from overvalued equity.
5. What are the policy implications of market-driven corporate finance? To what extent should policy be tailored in an attempt to reduce nonfundamental movements in prices and interest rates? What is the impact on corporate finance and investment?

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