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Abstracts of Papers Presented at the 1995 AFA Meeting

AGRAWAL, ANUP, and CHARLES R. KNOEBER, *Firm Performance and Mechanisms to Control Agency Problems between Managers and Shareholders.*

This paper examines firm choice of the mix of mechanisms used to reduce agency problems between managers and shareholders. We empirically address two questions. First, is there interdependence among the use of the various "control mechanisms"? Second, does cross-sectional evidence suggest that firms fail to adjust their use of these control mechanisms optimally? We consider the use of seven control mechanisms in a sample of nearly 400 large U.S. firms. These mechanisms are shareholdings of insiders, institutions, and large blockholders; use of outside directors; debt policy; the labor market for managers; and the market for corporate control.

We present two main empirical findings. First, there is evidence of interdependence among the use of these mechanisms. Second, given this interdependence, cross-sectional OLS regressions of single mechanisms on firm performance can be misleading. Like prior studies, we find a positive effect of insider shareholding on firm performance when insider shareholding is examined alone. However, this effect disappears when all of the mechanisms are included in an OLS estimation and when the relation is estimated within a systems framework. We also find a negative effect of a larger fraction of outside directors, greater debt, and more activity in the market for corporate control on firm performance in OLS estimations, but only the negative effect of board composition persists in the systems framework. The lack of a relation between insider shareholding and firm performance in the more inclusive estimations is consistent with the argument in Demsetz and Lehn (1985) that firms choose ownership structures optimally. By contrast, the persistent negative relation between board composition nd firm performance suggests that boards contain too many outsiders.

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AIT-SAHALIA, YACINE, *Dynamic Equilibrium and Volatility in Financial Asset Markets.*

This paper develops and estimates a continuous-time model of trading in a financial market where investors trade against a market maker. The market maker posts a price at which she is required to take the opposite side of the order submitted. Immediately after an order is executed, the market maker can adjust the price in response to the order. Observing the price being posted, each investor acts to rebalance optimally the portfolio, trading occurs, the market price is revised optimally by the market maker to maximize expected trading profits, and so on. Instead of prices, strategies constitute an equilibrium in this market. An equilibrium is a market maker's pricing rule and a sequence of investors' trading strategies that are best response to each other.

It is shown that a pricing rule where the market price moves in the direction of the equilibrium price is sustainable as an equilibrium, with investors acting optimally. In equilibrium, the market maker (who controls the price adjustment process) finds it optimal to "add volatility" to the price she posts (compared to the fundamental value of the asset) in order to reduce the holdings of risk-averse investors when high returns are expected.

The model produces in a single and simple framework the two major findings of the empirical price-volume literature: serially correlated volatility and contemporaneous volume-volatility correlation. The fundamental price at every instant can be estimated based on the path of the actual market price, as well as transaction volume, up to that time. Nonlinear filters are derived to address the unobservability of the fundamental price. The model is estimated on transaction data.

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ALDERSON, MICHAEL J., and BRIAN L. BETKER, *Liquidation Costs and Capital Structure.*

We examine the relation between liquidation costs and capital structure for 88 firms that completed reorganizations under Chapter 11 of the Bankruptcy Code. Firms emerging from Chapter 11 bankruptcy have an opportunity to select a completely new capital structure, and we observe firms at the point when this choice is made. We investigate not only the leverage ratio, but the mix of public and private debt, and the terms of the restrictive covenants in the debt contracts as well.

Firms that reorganize in bankruptcy must disclose their postbankruptcy financial structure as well as estimates of going concern and liquidation values of their assets. We use these estimates to define the cost of liquidation as the excess of going concern value over liquidation value, and interpret this difference as a measure of asset specificity and asset illiquidity. Firms have low liquidation costs if the value of their assets in liquidation is nearly as great as their value in current use. Liquidation costs are high if the value of assets in liquidation is substantially less than their value in current use. This may occur if asset specificity is high, or if asset specificity is low but the secondary market for the assets is thin.

Theoretical models link asset characteristics and capital structure by comparing the benefits of financial leverage to the costs of liquidation. The models suggest that high leverage is discouraged if assets are firm-specific and hence not easily liquidated or trade in illiquid secondary markets. While these models focus on the choice between debt and equity, they are also consistent with the idea that firms may move from highly restrictive to less restrictive debt contracts as liquidation costs increase. Thus we also consider the mix of public and private debt and the nature of the restrictive covenants that govern the sample firms.

We find that firms with high liquidation costs have lower debt levels with less restrictive covenant terms, and are more likely to raise new equity capital as part of the reorganization process than firms with low liquidation costs. The debt of firms with high liquidation costs is also more likely to be public and unsecured. Firms with high liquidation costs thus choose capital structures that make future financial distress less likely. These results identify the importance of liquidation costs in determining the capital structure of the firm.

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ALLAYANNIS, GEORGE, *Exchange Rate Exposure Revisited.*

This paper examines the relationship between exchange rate changes and firms' values. We design a sample selection process to select firms from the industry, at the Standard Industrial Classification 4-digit level, with the largest exante exposure to exchange rates according to a criterion that takes into account both the export and the import activities of firms. We find no evidence of contemporaneous exchange rate exposure, however. Consistent with previous research in the area, we find that a lagged change in exchange rates significantly affects industry returns over a long period (1976 to 1990). Controlling for size, mature firms from this industry are less exposed than are relatively less mature firms. This is consistent with the hypothesis that hedging exchange rate exposure can be enhanced over time. In general, we find that exchange rate exposure changes over time and varies for different firms in an industry. In the automotive industry, for example, of the Big 3, only Ford is significantly exposed to exchange rates and then, only during the period 1985 to 1987.

In contrast with the largely insignificant exchange rate exposure at short horizons, the exposure of the automotive firms at long horizons is both statistically and economically very significant. For example, Ford's exposure to the dollar/yen movements during the period 1976 to 1990 increases in absolute value from -0.2119 (statistically insignificant) for the one-month horizon to -0.6065 (statistically significant) for the twelve-month horizon. The statistical power of the regressions as measured by the adjusted R^2 is also increasing with the horizon. For example, in the regression that captures Chrysler's exposure to the dollar/yen movements for the period during 1976 to 1990, the adjusted R^2 are increasing by 75 percent, from 0.29 for the one-month to 0.51 for the twelve-month regression.

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ALLEN, FRANKLIN, and RISTO KARJALAINEN, *Using Genetic Algorithms to Find Technical Trading Rules.*

In this paper, a genetic algorithm is used to find technical trading rules for Standard and Poor's Composite Stock Index in 1963 to 1989. Compared to a simple buy-and-hold strategy, these trading rules lead to positive excess returns in the out-of-sample test period of 1970 to 1989. In addition, the rules appear to reduce the variability of the returns. The results are compared to benchmark models of a random walk, an autoregressive model, and a GARCH-AR model. Conventional statistical tests and bootstrapping simulations are carried out to study the robustness of the results. It is found that the excess returns are both statistically and economically significant, even when transaction costs are taken into account.

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ANGBAZO, LAZARUS, *Commercial Bank Net Interest Margins, Default Risk, Interest-Rate Risk, and Off-Balance Sheet Banking.*

This paper is an empirical exposition of the relationship between bank net interest margins and interest rate risk, default risk, and off-balance sheet banking activities. The analysis is based on an empirical specification of the components of the net interest margins, derived from a dealership model of the bank, that includes the risks and institutional factors that systematically affect pricing practices in banking. The paper uses call report data for large banks during 1989 to 1993. The results are consistent with the net interest margins of U.S. Commercial Banks reflecting both default and interest rate risk premium. The evidence suggests that default risk is the sole determinant of the net interest margins of large banks; interest rate risk is not a significant factor for the margins of money-center banks, consistent with their greater ease in hedging with off-balance sheet instruments. By contrast, super-regional and regional banking firms are sensitive to interest rate risk but not to default risk. The interest margins of the smaller (local) banks are sensitive to interest rate risk as well as default risk.

In the second part of the paper, we develop and test empirical implications for various theories of the motivation and impact of off-balance sheet risk exposures. An implication of the underinvestment hypothesis is that off-balance sheet instruments improve profitability since they permit banks to engage in activities that would be impossible if restricted to deposit- or equity-financing. On the other hand, the moral hazard hypothesis suggests that the overall risk of banks is accentuated by off-balance sheet instruments. This paper presents evidence that is consistent with the former hypothesis, but not the latter. On the basis of a summary statistic of the overall impact of off-balance sheet risk, we do not find evidence that off-balance sheet activities increase credit risk, interest rate risk, or liquidity risk. Regressions of the net interest margins and noninterest margins on off-balance sheet activities show that there is a significant (negative) impact on the interest margins, and a significant (positive) impact on the noninterest margins, for money center banks, both consistent with the underinvestment hypothesis. The results do not support the net interest margins or the noninterest margins of the smaller regional and local banks, reflecting a significant impact of off-balance sheet activities.

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ANSHUMAN, V. RAVI, and AVNER KALAY, *Market Making Rents under Discrete Prices—Theory and Evidence.*

The paper presents a value maximizing rationale for an exchange imposed restriction on prices to be multiple of (for example) $^1/_8$th of a dollar. Such a restriction on the distribution of prices creates a wedge between the underlying "equilibrium" price observed prices. As such, it imposes additional transaction costs (henceforth DREC: discreteness related execution costs) on traders. A recent *Business Week* article (November 1993) estimates the DREC to be several billions of dollars per year. One wonders, therefore, why would an exchange impose this cost on its traders?

In this paper, we suggest that an exchange can find it optimal to impose a minimum stock price variation. The minimum "tick size" poses a barrier to competing forces, thereby creating positive profits. We show that the effective commissions in a discrete price economy depend on the location of the underlying equilibrium price. Discreteness of prices, per se, cause asymmetric ask and bid commissions and market breakdowns. Since DREC is time-varying and mean-reverting, the asymmetric bid-ask spread is time-varying as well.

If prices are continuous, the midpoint of the bid-ask spread is an unbiased estimate of the equilibrium price. Since the equilibrium price is always at the midpoint of the spread, the variance of the estimate should be zero. However, when prices are discrete, the equilibrium price is different from the midpoint of the spread. The deviation from the midpoint of the quoted spread is bounded by the tick size, but its location within the quoted spread varies with time. Our model predicts that the variance of the location of the equilibrium price is decreasing in the quoted spread. We use transaction data to test this implication. The evidence we find is consistent with our model.

Interestingly, discrete prices need not result in additional transaction costs for liquidity traders. Informed traders would take into consideration DREC and invest less in acquiring information. Thus, discrete prices can reduce the asymmetry of information. We find that on both the bid and ask sides of the market, locations of the underlying equilibrium price for which the effective commissions are less than the continuous-case equilibrium commission.

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BAILEY, WARREN, and Y. PETER CHUNG, *Exchange Rate Fluctuations, Political Risk, and Stock Returns: Some Evidence from an Emerging Market.*

This paper examines the importance of exchange rate fluctuations and political risk for stock prices. These factors are central to many problems in international financial management. If the effects of currency and political risks do not vanish in well-diversified portfolios, exposure to these factors should yield risk premiums in an asset market in equilibrium.

There is some evidence that exchange rate fluctuations are a priced factor in cross-sections of national stock index returns converted into a common currency. However, little evidence that these risks are priced has emerged from studies of cross-sections of stock returns from the same country. Studies of political risk demonstrate the significant impact of political and regulatory events on equity values, especially for banks. However, these event studies do not attempt to test whether sensitivity to political events yields an ex ante equity market risk premium.

We search for evidence that exposure to exchange rate fluctuations and political changes affects expected returns for individual companies. We adopt a multifactor model with exchange rate and political risk proxies, and measure the extent to which exposure to these factors explains cross-sections of individual security returns. We apply these ideas to financial market data from a developing country, Mexico, where exchange rate fluctuations and political uncertainty are accentuated. Our methodological innovation is the use of Mexican sovereign debt and currency market prices to create proxies for changes in currency and political risks, and to measure ex ante risk premiums similar to those we seek in the equity market.

We find some evidence consistent with the presence of time-varying equity premiums for exposure to our measures of exchange rate and political risks. There are significant associations between equity market premiums for these risks and related premiums in the currency and sovereign debt markets. To the extent that exchange rates fluctuate significantly and political risks are significant, we expect to observe similar effects in equity markets of other countries. Our results highlight the importance attached to exchange rate and political risks in the international finance literature. They also validate the usefulness of mainstream empirical asset pricing methodologies, and, in particular, highlight the utility the researcher can derive from currency and debt market information. Limitations imposed by the small time series and cross-section of data also point out difficulties which arise in empirical studies of emerging capital markets.

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BAKER, GEORGE, and CYNTHIA MONTGOMERY, *Conglomerates and LBO Associations: A Comparison of Organizational Forms.*

The leveraged buyout (LBO) wave of the 1980s led to significant "deconglomeration" in the U.S. economy. Many diversified conglomerates were taken over and dismantled by the LBO juggernaught. Yet, as a direct result of these transactions, by the end of the decade there were a number of large, diversified organizations—LBO associations—that looked similar to the very conglomerates that they had dismantled. This paper explores these similarities, as well as the differences, between LBO associations and conglomerates, focusing on the role of the "headquarters" in each. Using interview data from 16 of these organizations, we explore the strategies of the headquarters, the ownership and governance of headquarters, and the systems that each uses to control their operating units. We document several important differences between the two types of organizational forms, including differences in the degree to which they exploit synergies, differences in acquisitions strategies, and differences in the propensity to divest units. We argue that these differences are consistent with differences in how the two organizational forms manage their operating units. In particular, we argue that the LBO associations essentially "outsource" the control of these units to lenders and the equity markets.

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BARCLAY, MICHAEL J., and CLIFFORD W. SMITH, JR., *The Priority Structure of Corporate Liabilities.*

A central issue in corporate finance is the explanation of corporate leverage choices. Although much of the extant analysis proceeds as if firms issue only common stock

and a homogeneous class of debt, firms issue a rich array of fixed claims that vary in several important dimensions. For example, they vary by maturity, conversion rights, call provisions, and priority. In this paper we focus on variation in priority structure of the firm's fixed claims.

There is little available evidence on variation in priority structure across firms. Thus, we believe that an important contribution of this paper is to document variation in the use of claims of different priorities for a large sample of industrial firms. Using data from COMPUSTAT, we examine five priority classes: capitalized leases, secured debt, ordinary debt, subordinated debt, and preferred stock. We report both aggregate measures of priority structure as well as the distribution of the use of each of these instruments. We also offer basic tests of variation in priority structure. Our primary focus in these tests is to provide a better understanding of the relative importance of incentive contracting, information asymmetry, and tax hypotheses in explaining variation in the use of fixed claims of different priority. Our evidence offers consistent support for the incentive contracting hypotheses, mixed support for the tax hypotheses, and no support for the signaling hypothesis.

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BARTOV, ELI, GORDON M. BODNAR, and ADITYA KAUL, *Exchange Rate Variability and the Riskiness of U.S. Multinational Firms: Evidence from the Breakdown of the Bretton Woods System.*

This study assesses the economic impact of exchange rate variability on the riskiness of U.S. multinational firms by examining the relation between exchange rate variability and the stock return volatility of U.S. multinational firms and by decomposing this relation into component of systematic and idiosyncratic risk. Focusing on the period around the switch from fixed to floating exchange rates, we find a significant increase in the volatility of U.S. multinational monthly stock returns corresponding to the observed increase in exchange rate variability. Using a single factor market model, tests indicate a significant increase in market risk (beta) for this set of U.S. multinational firms between these two periods. Both of these findings transcend the impact of the general macroeconomic uncertainty of this period, as the changes are significant relative to the behavior of firms in two control samples. A closer examination of the increase in market risk suggests that it represents an increase in asset risk, not financial risk, for multinational firms relative to the control firms. Sensitivity analysis with respect to the equilibrium asset pricing specification is also presented.

Collectively, these results suggest that the increase in exchange rate variability after 1973 was perceived by investors to be associated with an increase in the riskiness of cash flows of multinational firms that could not be avoided. One rational explanation for this result is that with the advent of floating exchange rates, positions in foreign currency contained market risk. Thus, for multinational firms with substantial assets denominated in foreign currency, the additional market risk of foreign currency positions changed the firms' required rate of return on capital. This explanation is consistent with the evidence of previous research that the risk premia on foreign currency positions covary positively with the risk premium on the U.S. equity market.

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BASAK, SULEYMAN, *An Intertemporal Model of Segmentation.*

The primary focus of the existing finance literature on international capital market segmentation has been on the asset price, portfolio choice, and welfare implications of the diversification losses due to reduced risk-sharing opportunities. A shortcoming of this work is that international debt is used only to facilitate risk-sharing among countries, and not for intertemporal borrowing or lending against a better or worse future wealth. Furthermore, due to their lack of intertemporal consumption, the current models must exogenously specify the interest rate on international debt, and so cannot determine the effects of segmentation on the cost of borrowing between countries. Ignoring the use of international debt for intertemporal consumption smoothing is unappealing in an analysis of market segmentation, since many countries (such as less-developed countries) facing segmentation issues have economies that are critically dependent on international debt precisely for intertemporal consumption smoothing purposes.

This paper extends the previous segmentation literature to a richer framework by explicitly including intertemporal consumption, leading to an endogenously determined interest rate, and an international bond market used for both risk-sharing and intertemporal consumption smoothing. The model describes a two-period mean-variance world consisting of two countries heterogeneous in their preferences, endowments, and impatience. Several new insights are gained concerning the asset prices, demands, and welfares. The interest rate monotonically increases as the markets integrate, leading to nontrivial changes in the asset price comparisons of the previous literature. Four factors driving countries' intertemporal consumption smoothing and international borrowing behavior are identified. Most importantly, in contrast to the existing literature, this model shows that a country's welfare may decrease on market integration, giving some rationale for the observed prevalence of international capital market segmentation. The paper also points to an important relationship between international debt and the influence of market integration on welfare. Specifically, countries that are borrowing in the international bond market are the countries that may become worse off on market integration. Intuition for all results is offered.

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BATTALIO, ROBERT H., and MARK BAGNOLI, *CBOT Membership Prices and the Value of Specialization: Theory and Evidence 1982–1986.*

Market making in contracts traded on Chicago Board of Trade (CBOT) markets is done by floor traders who must either own or lease a CBOT membership. From November 1982 until December 1986, the CBOT offered memberships that allowed the owner to trade in the Commodity Options Market (COM), the Government

Instruments Market (GIM), and the Index, Debt, and Energy Market (IDEM). One could also be an Associate member with the right to trade in any of those markets but restricted to trade in just one at a time. These different memberships produce some (alphabet) members who specialize in making markets in certain contracts and some (Associate) members who do not. An important question is whether there is value to specialized market making. This could be determined directly with access to members' trading profits. Without such access, the existence of all of the aforementioned memberships and markets for them allows us to infer the value of specialized market making. We use data on bids, asks, and transactions prices to infer the profitability of alphabet member trading and estimate the implied value of an Associate membership, assuming that there is no value to specialization. If the estimate is equal to the market price of an Associate membership, then there is no value and if it is larger, the difference is the value of specialized market making. We find that the estimated value of an Associate membership in each of the five subperiods of our sample is not significantly different from the market value of an Associate membership, and so we conclude that there is no discernible value to specialization.

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BEATTY, RANDOLPH, and IVO WELCH, *Legal Liability and Issuer Expenses in Initial Public Offerings.*

The selection and compensation of experts—the legal counsel, the auditor, and the investment banker—are among the most important decisions faced by issuers of initial public offerings (IPOs). Using new data, our paper is the first attempt to investigate the role of the entire IPO coalition: underwriters, auditors, lawyers, and investors. We examine how expert compensation, IPO underpricing, and IPO underpricing uncertainty are related to: [a] expert quality; [b] legal caution and liability; [c] nonlegal risk signals; and [d] one another. The findings of our paper can be summarized as follows.

First, because IPOs have strict disclosure regulations, we are able to describe the first random sample of lawyer compensation in any market. Lawyer compensation is remarkably impervious to legal considerations and even their own quality. The presence of high-quality legal counsel is economically unimportant, but it may increase the compensation that issuers have to bestow on their underwriters, auditors, and investors.

Second, we explored the influence of risk on investor and expert compensation, offering three different signals of risk: low-price, insider retention, and the role of legal "disclaimers" in the IPO prospectus. Issuers that price low to induce analyst interest also underprice more (and thereby reduce their need to compensate experts). Legal liability is of only marginal importance to IPO underpricing. In contrast, experts are paid for accepting risk that impacts their liability as established in the 1933 act. Auditors are paid more for agreeing to fewer disclosures of specific risk factors in the prospectus, i.e., less for accepting the liability that comes with more risk-factors. Underwriters, involved later and less aware of the underlying firm characteristics, are paid more when they agree to sell "more suspicious" offerings with more risk factors requiring extra selling effort.

Third, underwriter compensation complements both auditor and lawyer compensation, while lawyer compensation complements best with auditor compensation.

The influence of expert compensation on IPO underpricing is different across experts, though. Although both high-quality underwriters and auditors reduce the necessary IPO underpricing, high underwriting fees may be associated with an increase in the need for IPO underpricing, while high auditing fees may be associated with a decrease in the need for IPO underpricing. This indicates that investors perceive higher audit fees to indicate better audit service, a signal incurred only by better IPO issuers, and higher underwriter fees as incentives for underwriters to take even marginal issues public. Lawyer compensation or quality plays a surprisingly limited role in IPOs, consistent with legal limitations imposed on lawyer culpability in IPOs.

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BEKAERT, GEERT, and CAMPBELL R. HARVEY, *Time-Varying World Market Integration.*

We try to explain the differences in expected returns across national markets with risk. However, risk is difficult to quantify in an international setting—particularly when there are barriers to investment. In completely integrated markets, risk refers to exposure to some common world factor. If a market is segmented from the rest of the world, its covariance with a common world factor may have little or no ability to explain its expected return. Our contribution is to propose a methodology that allows for the degree of market integration to change through time. While this method can be applied to a general multifactor model, the intuition can be readily obtained in a one factor setting. We allow conditionally expected returns in any country to be affected by their covariance with a world benchmark portfolio and by the variance of the country returns. In a perfectly integrated market, only the covariance counts. In segmented markets, the variance is the relevant measure of market risk. While our approach is not directly implied by any current asset pricing theory, it has the appeal of nesting, as special cases, two previous approaches to international asset pricing: complete segmentation and complete integration. Our integration measure, which arises from a conditional regime-switching model, is a time-varying weight that is applied to the covariance and the variance. The model allows for differing prices of variance risk across countries that depend on country-specific information and a world price of covariance risk that depends only on global information. The model is conditional in the sense that predetermined information is allowed to affect the expected returns, covariances, variances, and the integration measure.

Our procedure allows us to recover fitted values for the integration measure, so that the degree and trend of a particular market's integration can be depicted through time. While caution must be exercised in interpreting many of our results, no one has ever attempted to estimate the degree and variation through time in capital market integration. In many emerging markets, variation in the integration measure coincides with capital market reforms. In contrast to general perceptions that markets are becoming more integrated, our results suggest that some countries are becoming less integrated into world markets.

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BERGER, PHILIP, and ELI OFEK, *Diversification's Effect on Firm Value.*

We estimate diversification's effect on firm value by imputing stand-alone values for individual business segments. Theoretical arguments suggest that diversification has both value-enhancing and value-reducing effects. The potential benefits of operating different lines of business within one firm include greater operating efficiency, less incentive to forego positive net present value projects, greater debt capacity, and lower taxes. The potential costs of diversification include the use of increased discretionary resources to undertake value-decreasing investments, cross-subsidies that allow poor segments to drain resources from better-performing segments, and misalignment of incentives between central and divisional managers. There is no clear prediction about the overall value effect of diversification.

Comparing the sum of the imputed stand-alone values to the firm's actual value implies a 13 to 15 percent average value loss from diversification during 1986 to 1991. The value loss is smaller when the segments of the diversified firm are in the same two-digit Standard Industrial Classification code. Segments of multisegment firms are less profitable then stand-alone firms in the same industry. We identify overinvestment in segments from industries with limited investment opportunities, as measured by a low Tobin's *q-ratio*, as one source of the value loss. An additional source of loss in value is cross-subsidization of poorly performing divisions by better-performing divisions. The value loss is reduced by a modest decrease in taxes.

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BERK, JONATHAN B., *An Empirical Re-Examination of the Relation Between Firm Size and Return.*

The object of this paper is to determine whether there is in fact a relation between firm size and average returns. In an earlier paper, "A Critique of Size Related Anomalies," (*The Review of Financial Studies*, vol. 8, no. 2) I argue that the size related regularities in asset prices should not be regarded as anomalies. I show that these regularities could arise solely from the risk premium contained in market measures of firm size. Indeed, I demonstrate the opposite result; that is, that a truly anomalous regularity would be if an inverse relation between market value and return were *not* observed. I show theoretically 1) that the relation between market value and return should be observed in the economy, and 2) why market value will in general explain the part of the cross-section of expected returns left unexplained by an incorrectly specified asset pricing model. An important implication of this critique is that the observed relation between market value and return does not necessarily provide evidence of a relation between firm size and return.

Using a data set in which a strong relation between market value and return is known to exist, this paper fails to find a significant relation between average returns and four other measures of firm size that are not subject to the bias pointed out in the critique. Furthermore, in a data set in which market value does provide significant additional explanatory power over the single beta model, the same result is demonstrated not to be true of the other size measures. I therefore find no evidence that there is a cross-sectional relation between firm size and return. Consequently, I conclude that there is no evidence that the size effect is due to the existence of economy-wide risk factors related to the size of the firm. Instead, the results are evidence in favor of the hypothesis in the earlier paper—that the size effect is due solely to the endogenous identity relating the market value of a firm to its discount rate.

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BERKOVITCH, ELAZAR, RONEN ISRAEL, and JAIME ZENDER, *The Design of Bankruptcy Law: A Case for Management Bias in Bankruptcy Reorganizations.*

In an incomplete contracting environment, bankruptcy is considered to be a renegotiation of the firm's financial contracts. An optimal bankruptcy law is derived as optimal restrictions on the environment within which the claimants to a distressed firm bargain. The law is used as a commitment device to ensure actions that are ex ante optimal but not subgame perfect. It is shown that the bankruptcy court can use two types of mechanisms to implement the optimal bankruptcy outcome: direct restrictions on the bargaining game between the claimants, and the use of a "restricted auction." In both cases, the restrictions prevent the strategic use of bankruptcy by firms not in financial distress, provide for truthful revelation of information so that distress results in an ex post efficient allocation of resources, and establish a bias towards the manager in reorganizations that provide correct ex ante decision making incentives.

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BHAGAT, SANJAI, and RICHARD H. JEFFERIS, JR., *Corporate Performance, Governance, and Discipline: The Impact of Defensive Activity on Takeovers and Managerial Turnover.*

We examine the impact of firm performance, ownership structure, and corporate takeover defenses on takeover activity and managerial turnover. Our focus is the efficacy of corporate takeover defense. A vast literature suggests that takeovers and the managerial labor market serve to discipline poor performers in the managerial ranks, and also suggests that corporate takeover defenses are designed to shield incumbent managers from these forces. If this is in fact the case, and the belief that motivates the adoption of takeover defenses is rational, the presence of these defenses should be associated with a decline in takeover activity and extended job tenure for managers.

The results presented here provide little support for this hypothesis. We do observe a negative correlation between takeover activity and takeover defense that is statistically significant. But the introduction of a performance variable into a model that relates takeover activity to takeover defense reverses the sign of the relationship between takeover activity and takeover defense. In a model that allows the relationship between performance and takeover activity to vary with takeover defense, we find that defensive activity is ineffective.

In the case of management turnover, our results are even stronger. The frequency of CEO departures is uncorrelated with the status of takeover defenses at firms in our sample. This statement is consistent with both simple correlations, and with the estimates from probit models, where we find that turnover is related to performance. At firms with poison pill defenses, there is a statistically significant relationship between management turnover and performance.

We stress that these results do not imply that defensive activity is costless to shareholders. It may well be the case that managers who are shielded by takeover defenses perform less well than they would have had the takeover defenses not been in place. This hypothesis is consistent with both the results reported here, and with indirect evidence from announcement returns. Our evidence does, however, suggest quite strongly that takeover defenses are not completely effective in insulating managers from the consequences of poor performance.

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BILLETT, MATTHEW T., and MICHAEL RYNGAERT, *The Effect of Leverage on the Equity Premium Paid in Cash Tender Offers.*

Previous studies of tender offer premiums focus on the percentage revaluation of target equity as opposed to the percentage revaluation of target assets. This is understandable, given that tender offers are for the stock of the firm and that it is difficult to measure any change in value of nonequity claims of the firm. If, however, the ability to improve a firm is invariant to the firm's capital structure, all else equal, the percentage premium paid per dollar of target assets should be constant across targets, and the percentage premium offered to common stock shareholders should increase proportionately with the firm's debt to equity ratio. We refer to this as a pure leverage effect.

This paper empirically examines: (1) if there is any link between leverage and percentage takeover premiums to target common stock and (2) if there is a pure leverage effect on the equity takeover premium as described above. There are a variety of reasons to suspect the absence of a pure leverage effect. In particular, something less than a pure leverage effect will be observed when (1) noncommon stock claimants of the firm capture some of the rents from a takeover through mechanisms such as debt coinsurance and appreciation of convertible securities; (2) firms that have greater financial leverage are run more efficiently or take greater advantage of debt tax shielding such that their assets cannot be as highly revalued through a takeover; and/or (3) the difficulty in accurately measuring the value of financial liabilities leads to an error in variables problem that understates the link between leverage and tender offer premiums.

Using a sample of 145 cash tender offers initiated during the period 1980 to 1989, we find that financial leverage does have a significant positive impact on tender offer premiums. The impact is not as large, however, as one might expect if the revaluation of target assets were invariant to financial leverage. While we provide weak evidence consistent with nonequity claims receiving a portion of the benefits from the takeovers through debt coinsurance and appreciation of convertible securities, we conclude that the lack of a "pure leverage effect" is due in large part to measurement error in leverage variables.

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BØHREN, ØYVIND, B. ESPEN ECKBO, and DAG MICHALSEN, *Why Underwrite Equity Rights Offerings.*

There is an international trend among exchange-listed firms towards selecting underwritten flotation methods when issuing seasoned equity. For industrial issuers in the U.S., this trend caused the uninsured rights offer method to virtually disappear by the early 1980s, and the relative frequency of rights offers is declining also in the smaller Canadian, European, and most Pacific Rim equity markets. The trend towards underwritten offers occurs despite substantial evidence that the direct flotation costs associated with the traditional uninsured rights offer method are significantly lower than the underwriter fee.

This paper examines empirically alternative theoretical arguments for the decision to underwrite seasoned equity rights offers, focusing in particular on the role played by current shareholder subscription to the issue. The institutional setting is the Oslo Stock Exchange, a closely held equity market where uninsured rights and rights with standby underwriting are the dominant flotation methods for seasoned equity. Over the sample period, rights issuers switched to an almost exclusive use of standby underwriting, a change that occurred despite our finding that standby rights have significantly higher direct flotation costs than uninsured rights. However, we also find that issuers are less likely to underwrite a rights offer the higher the expected level of shareholder subscription, possibly because a high level of shareholder takeup attenuates adverse selection effects of the issue, as argued recently by Eckbo and Masulis (1992).

We also find that the market reaction to uninsured rights offers is significantly positive and greater than the (nonpositive) market reaction to standbys, which further supports the adverse selection argument. Moreover, nonlinear cross-sectional estimation reveals that, regardless of the flotation method, the market reaction to industrial issues decreases with the size of the offering, with the size of the preannouncement runup in the issuer's stock price, and with the proportion of the voting stock held by management and board members prior to the issue, possibly due to market concerns with adverse selection. Finally, the market reaction increases with the size of the subscription price discount in the rights offer, possibly due to perceived dividend implications of a deep discount offer.

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BOLLERSLEV, TIM, and HANS OLE Æ. MIKKELSEN, *Modeling and Pricing Long-Memory in Stock Market Volatility.*

In this paper a new class of fractionally integrated GARCH and EGARCH models for characterizing financial market volatility is discussed. It is argued that conventional models do not provide sufficient flexibility to account for the very slow dissipation of shocks to the volatility process typically encountered with high frequency financial data. As a consequence the empirical literature reports conditional variance processes that are approximately integrated or persistent for stock returns, implying that volatility forecasts of all horizons are sensitive to the current state of the market. In contrast, intuition suggests that volatility processes should be mean-reverting in a forecasting sense such that volatility is expected to return to a more natural level after a period of turbulence. An added flexibility is provided within the new class of fractionally integrated volatility processes while nesting conventional models. Monte Carlo simulations prove the reliability of quasi-maximum likelihood estimation methods, standard model selection criteria, and residual based portmanteau diagnostic tests in this context for the sample sizes typically encountered with financial data. Estimation results provide new evidence that the apparent long-run dependence in U.S. stock market volatility is best described by a mean-reverting fractionally integrated process, so that a shock to the optimal forecast of the future conditional variance dissipate at a slow hyperbolic rate. The asset pricing implications of this finding are illustrated via the implementation of long-term option pricing formula. Specifically, option prices are found to be very sensitive to alternative formulations of volatility persistence, in particular for out-of-the-money options.

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BONSER-NEAL, CATHERINE, and GLENN TANNER, *Central Bank Intervention and the Volatility of Foreign Exchange Rates: Evidence from the Options Market.*

Central Banks were active participants in the market for foreign exchange during the 1985 to 1991 period. One often cited goal of intervention policy is the stabilization of the exchange rate. This paper tests whether the market perceives central bank intervention to be stabilizing by testing the effect of intervention on changes in ex ante volatility of the \$/DM and \$/Yen exchange rates from 1985 to 1991.

Our paper differs from previous research in three important respects. First, unlike earlier studies that employed GARCH methods, we estimate the ex ante volatility of \$/DM and \$/Yen exchange rates by the implied volatilities implicit in foreign exchange options prices. If the options market is efficient and if the options pricing model is correct, then the implied volatility will provide an unbiased estimate of ex ante spot exchange rate volatility. Second, we control for the effects of several U.S. macroeconomic announcements to ensure that intervention is not spuriously related to implied volatility changes. Third, we test whether central bank intervention is expected to have a lasting impact by examining the effect on the market's forecast of volatility between one week and three months into the future.

The intervention data used in the tests comes from two sources: the Board of Governors and the *Wall Street Journal*. The Board of Governors provides data on actual daily intervention by the Federal Reserve. We also used news reports from the Wall Street Journal to obtain days of perceived intervention by the Bundesbank and Bank of Japan, as well as by the Federal Reserve. We find that actual and perceived Federal Reserve and perceived Bank of Japan intervention in general either increased ex ante exchange rate volatility or had no effect. Perceived Bundesbank intervention had no effect over any period. These results suggest that central banks were not effective in stabilizing the exchange rate through foreign exchange market intervention.

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BRENNAN, MICHAEL J., and AVANIDHAR SUBRAHMANYAM, *Market Microstructure and Asset Pricing: On the Compensation for Adverse Selection in Stock Returns.*

Models of price formation in securities markets suggest that privately informed investors create significant adverse selection costs for uninformed investors. This implies that rational uninformed investors will demand higher rates of return on securities for which informational asymmetries are more severe. Given that extensive resources have been devoted by the microstructure literature toward estimating adverse selection costs, a natural empirical issue that arises is whether adverse selection costs are significant enough to affect a firm's cost of capital.

Motivated by the above observations, we investigate the empirical relation between stock returns and empirical measures of illiquidity due to adverse selection developed by Glosten and Harris (1988) and Hasbrouck (1991). Using CRSP data for the period 1984 to 1991, and ISSM intraday data for the years 1984 and 1988, we find a significant relation between required rates of return and our measures of illiquidity after adjusting for the Fama-French risk factors related to the overall market, firm size, and the book-to-market ratio, and also after accounting for the effects of the quoted bid-ask spread. We also find evidence of a concave return-illiquidity relation, and investigate seasonalities in the compensation for adverse selection. We find that the compensation for adverse selection is significantly high in January.

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BROUS, PETER, and PHILIP SHANE, *Analyst Behavior as an Explanation for Market Inefficiency with Respect to Earnings and Nonearnings Information.*

In this paper we develop and analyze a measure of information conveyed around quarterly earnings announcements that is not reflected in the earnings report itself. Using Institutional Brokers Estimate System (IBES) analyst forecast data, we measure this variable, which we refer to as non-earnings information, by the abnormal portion of analysts' earnings forecast revisions given the level of unexpected earnings. Abnormal forecast revisions are derived from the residuals of quarterly regressions of unexpected earnings on forecast revisions over the period 1984 to 1988. We find a contemporaneous relation between our proxy for nonearnings information and stock price changes. We also find that both stock prices and analysts' forecast revisions reflect an underreaction to nonearnings information and that the analysts' underreaction is not significantly different from the stock market's underreaction. Therefore, a possible explanation for the stock price underreaction to nonearnings information is that investors are following the advice of analysts.

Our method of evaluating whether analyst underreaction to nonearnings information explains the stock price underreaction extends the model developed by Abarbanell and

Bernard (1992). Abarbanell and Bernard find a significant market underreaction to earnings information beyond what can be explained by Value Line financial analysts' underreaction to earnings information. Our extension allows for the simultaneous analysis of relative analyst and market efficiency with respect to both earnings and nonearnings information. We replicate the Abarbanell and Bernard result using forecasts on the IBES database. We find, however, that allowing for analyst inefficiency with respect to earnings information to extend to the predictability of abnormal forecast revisions, as well as to the predictability of unexpected earnings, results in a measure of analyst inefficiency that is no longer significantly smaller than the measure of market inefficiency. Thus, analyst behavior appears to be a reasonable explanation for market inefficiency with respect to both earnings and nonearnings information.

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BROWN, STEPHEN J., and WILLIAM N. GOETZMANN, *Mutual Fund Styles.*

The style of fund management is taken to be a key descriptor characterizing differences across managers in the mutual fund industry. We find that the standard stylistic classifications such as "Growth," and "Growth and Income," do a poor job at capturing future cross-sectional return differences. We propose a new empirical approach to the problem of determining mutual fund styles. This approach is simple to apply, yet it captures nonlinear patterns of returns that result from virtually all active portfolio management styles. We find that the largest equity fund category, "Growth" typically breaks down into several distinct styles that differ in composition and strategy. Besides categories corresponding to commonly accepted styles such as "Growth," "Growth and Income," "Income," "International," and "Small Cap," we also find evidence of a group of "Timers," as well as a group of "Value" managers.

The classification method we propose groups funds in the space of returns. It is related to clustering methods and to switching regression techniques used in finance and other disciplines. Without using any information about the composition of the fund's portfolio, it identifies fund groupings that are useful predictors of cross-sectional *future* performance, as well as past behavior. Not only are they superior to common classifications such as "Growth" or "Income," but they also perform better than classification based upon risk measures and analogue portfolios. An out-of-sample test of cross-sectional explanatory value indicates that the return-based stylistic classification works nearly as well, as do factor loadings on predetermined and latent variables.

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BROWN, STEPHEN J., WILLIAM N. GOETZMANN, and STEPHEN A. ROSS, *Survival.*

Empirical analysis of rates of return in finance implicitly condition on the security surviving into the sample. We investigate the implications of such conditioning on the time series of rates of return. In general this conditioning induces a spurious relationship between observed return and total risk for those securities that survive to be included in the sample. These results have immediate implications for studies of equity premia.

In this paper we study some important case studies in the empirical literature of finance. Studies of long-term dependence in security markets focus on the statistical relation between successive holding period returns, where the holding period is of possibly extensive duration. If the equity market survives, then we find that the average return in the beginning is higher than the average return near the end of the time period. For this reason, measures of long-term dependence are typically biassed toward rejection of a random walk. In fact, we show analytically that the annualized variance measures for long horizon returns will fall to 43 percent of variances estimated using short horizon data, regardless of the volatility of returns and the ex ante probability of survival.

Another case is the behavior of excess returns around earnings announcement dates. Firms in financial distress are like at-the-money call options. We use the same analysis to show that survival induces a positive cross-sectional relation between returns in the announcement and postannouncement periods. This relationship corresponds to the accumulation of evidence supporting a postearnings announcement drift in stock returns. In another event study application we consider the case of stock splits. Stock splits are rarely announced in cases where the stock price falls. Using the analysis of this paper we study the case where we precondition the sample to include only those price paths where the price at announcement is greater than or equal to the average of past prices. Such preconditioning suffices to explain the run-up in prices prior to the split date reported by Fama *et al.* (1969).

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BURASCHI, ANDREA, and HAO LI, *Economic Activity and Welfare Implications of Alternative Structures of Intermediation.*

This paper studies two market structures of financial intermediation in an economy where entrepreneurs need to borrow to invest in new projects. The information structure is "costly state of verification." Heterogeneity is introduced by assuming that each entrepreneur is endowed with nonliquid wealth that can be used as collateral in financial contracts. We show the existence of credit rationing both in the case of a monopolistic intermediary and in the case of perfectly competitive, in the Bertrand sense, financial intermediation. We compare the total real investment under these two alternative market structures of intermediation and we show that the total investment depends on the distribution of nonliquid wealth in the economy. Aggregate shocks to the distribution of nonliquid wealth affect the number of entrepreneurs financed in equilibrium. The role of different market structures in the intermediation sector in determining equilibrium credit rationing and the level of business activity is analyzed. Welfare effects of financial deregulation and policy implications are discussed.

The model is then generalized by allowing venture capitalists to finance entrepreneurs in exchange for equity participation, and the question of financial disintermediation is dealt with under different assumptions on the information available to the stock market. Disintermediation results when intermediaries and lenders have symmetric information about entrepreneurs. When intermediaries have an informational advantage, entrepreneurs use capital structure to signal their types to potential buyers of stocks. It is shown that, depending on parameters of the model, both costless and costly equilibria are possible. In both equilibria the debt-equity ratio is shown to be positively related to the value of collateral. Our equilibrium solutions do not substantiate a "pecking order" theory of the capital structure, in the sense that it is never a separating equilibrium when only debt is issued. An interior solution of the capital structure is characterized.

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CARHART, MARK M., ROBERT J. KRAIL, ROSS L. STEVENS, and KELLY D. WELCH, *Testing the Conditional CAPM.*

We derive several specifications of the conditional Capital Asset Pricing Model (CAPM) and formulate explicitly testable versions of the CAPM using the results of Hansen and Richard (1987) and Cochrane (1992b). Specifically, we model the time-varying parameters of the conditional CAPM linearly in a set of instruments. In our versions of the conditional CAPM, we show that a model for the conditional mean returns on factors and assets is not required, but that explicit characterizations of the separate dynamics of the market risk premium and factor loadings are not delivered. We estimate and test the unconditional CAPM, several specifications of a conditional CAPM, and the Fama and French (1993) three-factor model using Hanen's (1982) Generalized Method of Moments (GMM) and traditional multivariate econometric methods. We derive and highlight the similarities between testing asset pricing models in the expected return-beta representation using ordinary least squares and the stochastic discount factor representation using GMM, and use both methods to interpret the results of our tests. We test on three sets of assets using both gross and excess returns. We find that the unconditional CAPM is generally rejected, both statistically and with economically meaningful errors, and that some versions of the conditional CAPM reduce the pricing errors of the unconditional CAPM, but are sensitive to the choice of test assets and econometric methodology. We also find that the Fama and French three-factor model consistently outperforms the conditional CAPM and is not sensitive to econometric methodology and form of the returns test.

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CHAKRAVARTY, SUGATO, and CRAIG W. HOLDEN, *An Integrated Model of Market and Limit Orders.*

Market and limit orders are the dominant instruments of trading on most security exchanges around the world. Yet until recently most models of market microstructure assumed that only market orders could be used for trading. We develop an integrated model in which a risk neutral informed trader optimally chooses any combination of a market buy, a market sell, a limit buy including the optimal limit buy price, and a limit sell including the optimal limit sell price. We allow orders to cross with one another without involving the market maker. This generates transactions inside the bid-ask spread, corresponding to what is observed in practice. Using minimal distributional assumptions, we are able to characterize the informed trader's optimal strategy.

We find that the trader sometimes chooses to submit market orders when the terminal risky asset value is inside the bid-ask spread. This results from the fact that a market buy submitted by the informed trader sometimes executes at a price below the ask by crossing with a limit sell submitted by an uninformed trader, and it never executes above the ask in our single period model. Thus, the expected execution price of the informed trader's market buy is below the ask. Hence, there are some terminal asset values, above the expected execution price and below the ask, for which it is optimal for the informed trader to submit a market buy.

With a richer menu of strategies to choose from, the informed trader is able to exploit mutually beneficial interactions between opposite order types. For example, any time the terminal asset value is above the bid, a combined market buy-limit sell is more profitable than a market buy only. Sometimes the two orders will cross against one another and the informed trader will end up with a zero net trade. This is beneficial because the combination eliminates states in which the same market buy submitted in isolation would have executed at a loss. In this sense, the limit sell acts as a "safety-net" for the accompanying market buy—an intuition that has not been captured in the extant theoretical microstructure literature. Adding specific distributional assumptions, we obtain an analytic solution and explore the comparative statics of the informed trader's limit price strategy.

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CHATTERJEE, SRIS, UPINDER S. DHILLON, and GABRIEL G. RAMIREZ, *Coercive Tender and Exchange Offers in Distressed High-Yield Debt Restructurings: An Empirical Analysis.*

This study empirically examines tender and exchange offers for a recent sample of 46 high-yield debt restructurings by financially distressed firms during the period January 1989 through December 1992. We find significant differences between tender and exchange offers in terms of financial characteristics, structure of targeted debt contracts, type of securities offered, nature of the holdout problem, and effectiveness of coercive tactics in reducing holdouts. Firms using tender offers appear to be in less financial distress than firms using exchange offers and face a more severe holdout problem as revealed by the structure of targeted debt.

We find a significant level of coercion in our sample. This is revealed by the large proportion of workouts soliciting exit consents or offering higher claim securities in exchange for old debt. We find that, after controlling for concurrent nonpublic debt restructurings, the probability of completing an offer and the proportion of bonds tendered is higher in the presence of coercive tactics, suggesting that coercion is effective in alleviating the holdout problem. Also, tender offers have higher completion rates and are associated with fewer postoffer filings of Chapter 11 than exchange offers. Further, tender offers appear to be more coercive than exchange offers and experience positive stock and bond price response to announcements. The analysis suggests that coercion is not detrimental to bondholders, and may benefit security holders by increasing the likelihood of a less costly, out-of-court restructuring.

Finally, we find that the LTV Corporation decision did result in a decline of exchange offers accompanied by an increase in tender offers. However, the decision did not render exchange offers ineffective in restructuring debt of financially distressed firms. It does appear that solicitation of exit consents in exchange offers has increased significantly after the LTV decision.

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CHUNG, Y. PETER, and ZHONG-GUO ZHOU, *The Predictability of Stock Returns—A Nonparametric Approach.*

Recently there has been substantial evidence regarding the predictability of stock returns. In the existing literature, the predictability of stock returns has been examined by using either one particular factor or a few factors on an ad hoc basis. A linear model with nice properties of the regression error term is assumed. The purpose of this paper is to develop an alternative econometric model for the predictability of stock returns that is consistent with the data and considers the econometric problems associated with ad hoc linear models. We first identify, through a set of diagnostic tests, five lagged predictive factors from a linear model. Using these factors, we then predict one-month-ahead stock index returns with a nonparametric approach. We show that a nonparametric model fits the data much better than linear models. We also find that our nonparametric model can correctly predict about 74 percent of stock index return signs.

One can argue that the predictability of stock returns challenges market efficiency. It is important to note, however, that the predictability of stock returns is not necessarily inconsistent with market efficiency because of transaction costs and risks. We examine whether our results challenge market efficiency. With various ex ante trading rules based on nonparametric predictions and transaction cost schedules, we compare the performance of "managed" portfolios with that of the "buy and hold" portfolios. We find that the managed portfolios are mean-variance dominant over the buy-and-hold strategies when no or low transaction costs are assumed. When high transaction costs are assumed instead, the mean-variance dominance diminishes. However, the Sharpe index of risk-adjusted portfolio performance indicates that the managed portfolios significantly outperform the buy-and-hold strategies, even for the high-transaction cost scenario. These results lead us to question whether the observed predictability of stock returns can be consistent with equilibrium. Nevertheless, we show that the difference in performance between the managed portfolios and the buy-and-hold strategies can be partially explained by the January effect of the small firm effect. In sum, this paper demonstrates the merits of using a nonparametric approach for predicting stock returns and testing market efficiency.

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COHEN, HUGH, and DOUGLAS McBETH, *The Effect of Tick Size on Treasury Auctions.*

This paper analyzes the effect that different tick sizes in various markets have on the prices of the same Treasury security in these markets. Commonly in the finance literature, prices of similar or identical Treasury securities are simply subtracted in making price comparisons, regardless of the presence of different tick sizes in the different markets. The paper makes two contributions. First, we provide an example that illustrates that unless the different tick sizes are accounted for, statistical tests involving these identical securities in different markets may be inaccurate. Second, a model to account for the different prices between the when-issued bid price and the average auction price is proposed that allows for the different tick sizes in the two markets. Market data for these identical securities appear to support this model. The model suggests that market participants would be willing to pay more for a Treasury security at the auction than in the when-issued market, counter to what we currently observe, which is a $^3/_8$ basis point bias in the other direction. Given the Treasury's recent interest in testing auction procedures that may increase revenue, permitting a smaller tick size at Treasury auctions may be an appropriate revenue-enhancing test.

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COTTER, JAMES F., ANIL SHIVDASANI, and MARC ZENNER, *The Effect of Board Composition and Incentives on the Tender Offer Process.*

Tender offers present a unique setting to examine the influence of outside directors on the board's decision making process and on shareholder wealth. Indeed, in a tender offer there is a potential divergence of interests between the managers and stockholders of firms that receive the offer. During this process, outside directors have a fiduciary responsibility to make decisions consistent with shareholder wealth maximization. Specifically, outside directors can influence critical aspects of the evaluation and response to the offer, including the initial premium, the decision to resist, postoffer bargaining, and the ultimate outcome of the offer.

Using a sample of 140 firms that received a tender offer during the 1988 to 1991 period, we present two major findings. First, the initial tender offer premium and the total shareholder gains during the offer increase with the fraction of professional outside directors (i.e., outside directors with a directorship in at least one other company). Second, boards with a majority of outside directors are more likely to resist tender offers and bargain for postoffer revisions than boards where inside directors constitute a majority. The market reaction to the tender offer also suggests that outside directors enhance firm value. We do not, however, find a significant relation between outside director ownership or the existence of provisions reducing director liability and shareholder wealth. Overall, our results suggest that board composition affects various aspects of the tender offer process and that outside directors with reputation capital perform a statistically and economically significant value-enhancing role during tender offers.

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DAS, SANJIV R., *Jump-Diffusion Processes and the Bond Markets.*

This paper analyzes the role of jump-diffusion interest rate models in the bond markets. There are both economic and statistical reasons for assuming such processes in bond pricing models. It is well known that standard diffusion models do not capture all the large variation in interest rates, and stochastic volatility models and jump-diffusion models do so better. This paper compares these alternative modeling approaches. The paper develops new bond pricing models for jump-diffusion processes, shows that they provide a better explanation of interest rate data, and relates jumps to Federal Reserve activity. This paper constitutes one of the first empirical studies of a jump-diffusion model of the term structure of interest rates.

The contributions in this paper are both theoretical and empirical. Using maximum-likelihood methods, we are able to successfully take our model to the data, and obtain statistical estimates of the jump distribution and frequency. The paper also provides empirical evidence of the improvement in fit of the jump-diffusion class of models. The paper extends the literature by allowing jumps to be stochastic, as well as follow time-varying distributions, provides pricing equations under these conditions, and estimates these new models, thus enabling us to compare the fit of jump-diffusion models against other candidate interest rate processes.

An objective of this paper is to attempt to explain the causes of jumps in the data. Surely, they are the result of information surprises, but the question is, which ones? The paper undertakes an examination of the relationship of Federal Reserve intervention in the interest rate markets as a possible cause of sharp interest rate shocks. It is found that Federal Reserve intervention produces a statistically and economically significant impact on the probability of jumps in the interest rate. One contribution of the paper is a simple approach to locating jumps in the data. This information is valuable in furthering our understanding of the causes of jumps in interest rates.

In summary, three objectives are achieved. One, the paper provides a theoretical model and empirical methodology for estimating the parameters of the model. Two, it assesses the performance of the jump-diffusion model in capturing features of the data versus other possible specifications, and finds that the combined jump-diffusion and time-varying volatility model fits the data significantly better than do other modeling processes. It compares jump-diffusion models with pure-diffusion ones, and concludes that skewness and kurtosis in the distribution of interest rates does impact the behavior of the term structure. And three, it examines the relationship of Federal Reserve target rate changes to jumps, and finds a significant relationship. Jumps are located in the data and found to occur more often in reaction to, than in anticipation of, Federal Reserve market intervention.

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DAVID, ALEXANDER, *Fluctuating Confidence and Stock Market Returns.*

The average relative profitability of different firms in the economy changes erratically due to many factors. Investors are either unable to observe these productivity switches or are unable to determine which firms' returns were affected by observed events. They continuously update their beliefs regarding the high and low productivity firms by observing the total return on each firm, which consists of the average productivity plus some noise. The learning behavior of investors is characterized by a belief process that exhibits fluctuating conditional variance. This is different from the learning behavior of the often used Kalman Filter in which the conditional variance is deterministic.

I characterize the portfolio choices, interest-rate, and total-returns processes in a Cox-Ingersoll-Ross (1985) style model where the productivities of assets are unobserved, but inferred as above. The portfolio choices are adjusted to hedge the risks introduced by fluctuating confidence. The model is capable of reproducing three stylized facts of stock-market returns and interest-rates. These are the skewness and kurtosis of returns and the "Predictive-Asymmetry" of returns: excess-returns and future changes in volatility are negatively correlated. Further negative returns cause reactions of larger magnitude. The success of the model in generating these features depends on the speed of learning about the productivity switches. Parameter values that lead to faster learning are consistent with large negative skewness of returns and the Predictive Asymmetry property. The slower learning version leads to greater kurtosis of returns. I show that a model based on the same fundamentals but with observed productivity-switches is not reconcilable with these features. Learning models based on the Kalman Filter cannot replicate the Predictive Asymmetry property. My analysis suggests that learning about the productivities of assets of the kind introduced here may be an important determinant of portfolio choices and observed asset returns.

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DENIS, DAVID J., and DIANE K. DENIS, *Performance Changes Following Top Management Dismissals.*

Internal monitoring mechanisms have recently received considerable attention in the wake of highly publicized CEO dismissals at well-known firms such as General Motors, Kodak, IBM, and American Express. In addition, the importance of internal control mechanisms has arguably increased following legal and regulatory developments that have curtailed activity in the external market for corporate control. However, there is surprisingly little evidence on the effectiveness of internal control devices in generating improvements in corporate performance.

We present evidence that forced top management changes are preceded by large and significant operating performance declines and followed by significant improvements in operating performance. These firms significantly downsize their operations following the management change, exhibiting large and significant declines in employment, capital expenditures, and total assets. Furthermore, the forced resignation subsample displays an unusually high incidence of postturnover external corporate control market activity. In contrast, normal retirements are not preceded by significant changes in operating performance, but are followed by small increases in operating income. These firms also exhibit a slightly higher than normal incidence of corporate control activity following the management change.

Although forced resignations are associated with valuable operating improvements, several additional observations suggest that these improvements should not be credited to effective board monitoring. First, forced resignations are rare events; only about 13 percent of our sample management changes are classified as "forced." Second, over two-thirds of our forced resignations appear to be due to factors such as blockholder pressure, takeover attempts, financial distress, and shareholder lawsuits, rather than to normal board monitoring. Finally, forced top management changes do not appear to be very timely; managers are forced out only after an extended period of poor performance involving substantial shareholder losses.

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DHATT, MANJEET S., YONG H. KIM, and SANDIP MUKHERJI, *Adverse Selection, Investment Opportunities, and Uninsured Rights Issues: Evidence from Korea.*

This paper investigates market reactions to rights issues in Korea, where most firms are closely held and highly leveraged, insider trading is common, and seasoned equity issues are usually uninsured rights issues with undetachable rights. We find that rights issue firms have superior earnings performance and higher growth compared to industry averages. Rights issue announcements are associated with positive abnormal returns that are directly related to proportionate offer size and growth in net fixed assets, and inversely related to percentage change in the debt-equity ratio. These results support the investment-opportunity hypothesis, but are inconsistent with the price-pressure and wealth-redistribution hypotheses. We also observe positive ex-date abnormal returns, which may be related to buying pressure from new investors on the ex day and selling pressure from existing shareholders on the previous day. Finally, there are no significant negative abnormal returns following the announcement, indicating negligible indirect costs for rights issues in Korea, where major shareholders tend to subscribe to and retain the shares offered.

We argue that the different market reactions to uninsured rights issues observed in the United States and Korea are consistent with the adverse-selection model and investment opportunity hypothesis. Our results indicate that rights issues are an efficient method of raising equity in the Korean financial environment. This may help explain why, in contrast to their virtual disappearance in the U.S., rights issues are a common method of raising equity in several foreign countries.

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DIZ, FERNANDO, *Long and Short-Run Dynamics of Volatility Formation in the S&P 100 Index Options Market: An Empirical Examination.*

This paper examines the long-run and short-run dynamics of volatility formation in the S&P 100 Index options market. Option pricing theory is used to characterize the long-run relationship between the volatility implied by option prices and actual volatility. An error correction model is estimated to investigate the short-run dynamics of volatility adjustment. The results suggest that the short-run adjustment of implied volatility is primarily determined by deviations from the long-run equilibrium relationship established by the theory. The magnitude of the implied volatility adjustment is proportional to the absolute size of the disequilibrium, and the direction of the change is negatively related to the sign of the disequilibrium. Long-run information appears to flow only from the underlying market to the options market.

The findings of this study further suggest that the S&P 100 Options Market provides only short-run information about the underlying market.

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DOW, JAMES, and GARY GORTON, *Noise Trading, Delegated Portfolio Management, and Economic Welfare.*

We consider a model of the stock market with delegated portfolio management. All agents are rational: some trade for hedging reasons, some investors optimally contract with portfolio managers who may have stock-picking abilities, and portfolio managers trade optimally given the incentives provided by this contract. Managers try, but sometimes fail, to discover profitable trading opportunities. Although it is best not to trade in this case, their clients cannot distinguish "actively doing nothing," in this sense, from "simply doing nothing." Because of this problem: i) some portfolio managers trade even though they have no reason to prefer one asset to another (noise trade). We also show that, (ii), the amount of such noise trade can be large compared to the amount of hedging volume. Perhaps surprisingly, (iii), noise trade may be Pareto-improving. Noise trade may be viewed as a public good. Results (i) and (ii) are compatible with observed high levels of turnover in securities markets. Result (iii) illustrates some of the possible subtleties of the welfare economics of financial markets.

The contracting problem that arises in our model is that if the contract allows a reward for not trading, portfolio managers may simply do nothing; the contract may either attract incompetent managers or lead competent managers to shirk. If this makes it impossible to reward inactivity, and limited liability prevents punishing ex post incorrect decisions, then the optimal contract may induce trading by the portfolio manager, which is simply a gamble to produce a satisfactory outcome by chance. We call this noise trade or churning.

We also consider the implications of noise trading for agents' welfare. Noise trading would appear to be costly for the employer since it lowers the expected rate of return on the portfolio. On the other hand, it will benefit hedgers: if managed portfolios earn lower rates of return, then uninformed hedgers earn higher returns. However, the higher return earned by the hedgers effectively reduces the cost of hedging; as a result they will trade larger amounts. In turn, this increase in volume can support a larger amount of investment by an informed fund manager. We provide an example in which noise trading or churning by portfolio managers is Pareto-improving. As we discuss, our analysis suggests that noise trade, by increasing liquidity, can be a public good.

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EDERINGTON, LOUIS H., and JAE HA LEE, *The Short-Run Dynamics of the Price Adjustment to New Information.*

We examine how prices in interest rate and foreign exchange futures markets adjust to the new information contained in scheduled macroeconomic news releases, such as the employment report or CPI, in the very short run. Using ten-second returns and tick-by-tick data, we find that the market price begins adjusting almost immediately following a news release—generally within the first ten seconds. The price adjusts in a series of small, but rapid, price changes, so it is clear that some trades occur at nonequilibrium prices. We find that the basic adjustment to the release is completed within the first forty seconds, certainly within the first fifty seconds, in the sense that the opportunity for trading profits based on the initial response disappears after this time. This is much more rapid than previous studies have observed in equity markets where the first trade following the release of an earnings report occurs fourteen minutes on average after the release. There is some evidence that prices slightly overreact in this first forty-second period, but that this is corrected in the second or third minute after the release.

Since volatility remains higher than normal after three minutes, it appears that the price continues to fluctuate, as those who disagree with the consensus market evaluation of the release's implications as reflected in the new price readjust their portfolios, or as further details from the release become available. However, these later price adjustments are independent of the initial price change. While volatility also tends to be higher than normal just before the news release, there is no evidence of information leakage. In addition, we find that the increased volatility following a news release primarily reflects more frequent, rather than larger, tick-by-tick price changes. In our analysis, we correct for the biases created by bid-ask spreads and tick-by-tick data by using what we refer to as pseudo-equilibrium prices. The basic picture that emerges from our research is that these markets are remarkably fast and efficient in incorporating new information in market prices.

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EPSTEIN, LARRY G., and ANGELO MELINO, *An Empirical Analysis of Asset Returns under 'Non-Bayesian Rational Expectations.'*

In this paper, we investigate a preference ordering that allows for a distinction between risk and uncertainty in an intertemporal setting. The preference structure includes a set of subjective measures (or "models") that are used for making probability assessments. When actions can be rationalized by a single such model, we are back in the framework for decision making under risk. We impose rationality on the preferences in two ways. First, we require that the set of models used by the agent includes the true one. For greater specificity, we model this set as an ε-contamination of the true measure. Secondly, we require that all models in the set agree on the utility of the equilibrium consumption process.

We posit a representative agent and look at the Euler equations for equity and Treasury Bill returns, using monthly aggregate U.S. data. We first show that standard preferences that ignore the distinction between risk and uncertainty are overwhelmingly rejected by the data, using some reasonable choices for instruments. Extending the preferences to allow for aversion to uncertainty generates mixed results. The resulting Euler equations are consistent with the data, but only if we allow for an aversion to uncertainty that appears high when compared to levels obtained from introspection.

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FLANNERY, MARK J., and JOEL F. HOUSTON, *The Market Response to Federal Inspections of U.S. Bank Holding Companies.*

Under present institutional arrangements, large U.S. banking firms are supervised by both market and government forces. Private rating agencies, stock and bond investors, and large depositors all seek to assess a bank's true condition and market value, while federal and state regulators undertake an extensive program of on-site examinations designed (in part) to assess bank condition. The unprecedented number of financial institution failures during the 1980s has led economists and politicians to question whether market forces should play a more prominent role in identifying and controlling large banks' risk exposures. The expense of extensive government supervision is difficult to justify unless it produces information beyond that contained in privately audited financial statements. However, if exams provide or validate information about individual banks' true conditions, government supervision may complement even the most radical proposals for increased reliance on market discipline.

This paper investigates whether federal inspections of bank holding companies (i.e., information gathering) add value to the market's supervisory process. Using a unique dataset assembled via a Freedom of Information Act request, we investigate the association between banks' reported book values and the market values of their equity for samples of examined versus unexamined banks during the fourth quarters of 1988 and 1990. We find that banks' reported accounting numbers contain relevant market information, and that the market responds significantly differently to accounting information produced when federal examiners were on-site during the quarter. The specific effects vary between years and according to a bank's size and capitalization. In 1988, on-site examinations raised bank market values, particularly for the smaller banks in our sample. (This finding is consistent with the hypothesis that smaller banks receive less extensive market oversight.) We also find that poorly-capitalized banks' market values are reduced by an on-site exam, implying that the regulatory burden is expected to be greater for these institutions. The 1990 exams had no significant effect on the average bank's market value, although they did influence the market's valuation of individual balance sheet items.

While our results imply that examinations can be valuable within the current institutional environment, the same benefits could perhaps be realized through other mechanisms, such as increased use of private auditors or other forms of market discipline. In this respect, the social value of holding company inspections remains an open question.

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GLASSMAN, DEBRA A., and LEIGH A. RIDDICK, *Why Empirical International Portfolio Models Fail: Evidence that Model Misspecification Creates Home Asset Bias.*

International portfolio models consistently predict that investors should put much more of their wealth into foreign assets than they actually do—a result known as "home asset bias." We use actual international portfolio data to show how model misspecification contributes to this bias. We find that three widely used simplifying assumptions produce optimal portfolio weights that are significantly different from

the weights produced by an unsimplified model. In particular, imposing the invalid assumption that PPP holds exaggerates the degree of "home asset bias." These findings suggest that researchers should pay greater attention to empirical model specification in the future.

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GOETZMANN, WILLIAM N., and ROGER G. IBBOTSON, *An Emerging Market: The New York Stock Exchange from 1815 to 1871.*

We analyze a new database of substantially all stocks listed on the New York Stock Exchange (NYSE) over its early history. We construct an annual index of NYSE equity prices over the period 1815 to 1871, and a monthly index over the period 1815 to 1848. For the first time, dividend returns for a broad sample of NYSE stocks are collected for the period 1825 to 1871, allowing an estimate of total returns for the NYSE through much of the last century. We find evidence that income returns represented a high proportion of total return for stocks in the 19th century.

This paper is a report on an on-going project to extend price and dividend information about securities traded on the NYSE back into the early history of financial markets in America. Instead of relying upon secondary sources, and ad hoc filtering procedures for including securities in the sample, we have gone to the primary historical records of price quotations and transactions to gather market data. We have sought to apply consistent methods of collection and analysis across industries. The goal of this "New York Stock Exchange Research Project," is to assemble a CRSP-like database for the early 19th century, and to provide quantitative information about the origins and evolution of the capital markets in the United States. At the time of writing, we have collected annual prices for substantially all stocks listed on the NYSE from 1815 through 1871, and monthly dividend data for a large portion of these companies for the period 1825 through 1870. In addition, we have collected monthly price information for NYSE-listed companies for the period 1815 through 1848. The price data represents an improvement over earlier efforts to trace NYSE equity prices, and the dividend data are unique. While NYSE dividends have been sampled for a few dates in the nineteenth century, and evidence for selected companies has survived, there has been no comprehensive attempt to collect NYSE dividends for the early years. As a result, researchers have been forced to use econometric procedures to extrapolate dividend returns from later periods.

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GOMPERS, PAUL A., and JOSH LERNER, *An Analysis of Compensation in the U.S. Venture Partnership.*

In this paper, we analyze the structure of compensation in U.S. venture capital partnerships. We contrast a learning model that extends Gibbons and Murphy (1992) to a situation in which a venture capitalist and an investor split the expected gains from investment with a signalling alternative. Empirical evidence from 419 U.S.

venture capital partnerships formed between January 1978 and December 1992 is generally consistent with the four primary predictions of the learning model. Compensation is bunched, with 81 percent of the sample funds sharing between 20 and 21 percent of the profit. The compensation of new and smaller funds shows considerably less variation than older and larger funds. Compensation of older and larger funds is significantly more sensitive to performance than compensation of newer and smaller funds. Finally, funds that focus on early-stage and high-technology investments have higher base compensation, consistent with the greater effort required to monitor these projects.

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GORTON, GARY, and ANDREW WINTON, *Bank Capital Regulation in General Equilibrium.*

We study whether the socially optimal level of stability of the banking system can be implemented with regulatory capital requirements in a multiperiod general equilibrium model of banking. In our model, banks invest in risky projects and issue deposits that provide liquidity to consumers who need to trade claims. Because of their unique ability to learn about projects, banks have a valuable charter that is lost when a bank fails. Deposit insurance is socially valuable because it reduces the risk of deposits, reducing their information sensitivity and thus enhancing their liquidity. Nevertheless, deposit insurance also causes incentive for individual banks to excessively substitute deposits for equity, creating a need for regulatory capital requirements.

A bank regulator sets capital requirements initially and may subsequently adjust them based on changes in the risk of bank asset portfolios. Although the regulator's goal is to maximize the total welfare of bank depositors and bank shareholders, the regulator is constrained by the objectives of the shareholders, who choose between meeting capital requirements and not entering (or exiting) the banking industry. Because bank exit results in certain loss of bank charter value, while even a risky bank has some chance of survival, the regulator never forces banks to exit; since banks anticipate this, capital requirements are not binding. Optimal regulatory policies can resemble "forbearance" in that the regulator deliberately chooses capital requirements that sometimes result in a high risk of bank failure. Finally, we derive comparative statics on the regulator's choice of initial capital requirements as a function of bank charter value, bank asset risk and mean return, and the cost of trading informationally sensitive financial claims.

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GRAHAM, JOHN R., *Debt and the Marginal Tax Rate.*

Do taxes affect corporate debt policy? This paper uses a straightforward approach to answer this question by testing whether the incremental use of debt is positively related to firm-specific, tax-code-consistent marginal tax rates. Using annual data for almost 10,000 firms for the years 1980 to 1992, evidence is provided that is consistent with the hypothesis that high-tax-rate firms issue more debt than their low-tax-rate

counterparts. This finding stands in contrast to the results of many academic papers, possibly because most previous research uses indirect measures of the corporate marginal tax rate. This paper examines incremental debt rather than debt levels, which are reflective of cumulative debt policy over many years. Incremental analysis focuses on decisions made at the margin and also helps alleviate concerns about spurious correlation.

Several other prominent theories of capital structure are tested in the paper. The results do not support the hypothesis that free cash flows lead to debt issuance. One test of the free cash flow theory indicates that firms do not increase their use of debt as they mature; this result is opposite of what the theory implies if maturing firms have increasing cash flows. Another test reveals that debt usage varies inversely with a direct measure of surplus cash. While this latter result is contrary to the free cash flow hypothesis, it does provide evidence in favor of the standard pecking order theory of financing choice. The results also suggest that firms that are growing larger issue relatively more debt than other firms.

Explicitly calculating marginal tax rates produces an empirical distribution for corporate tax-paying status. In any given year, about one-quarter of COMPUSTAT firms have a marginal tax rate near the top statutory rate, about one-fifth have a marginal rate near zero, and the rest are spread between zero and the top rate. The distribution indicates that there is substantial time series and cross-sectional variation in the corporate marginal tax rate.

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GREEN, RICHARD, and ARNOLD JUSTER, *Financial Structure, Distress, and Restructuring.*

In this paper we develop a model of the firm's optimal mixture of private and public debt financing when future financial distress may require the firm to renegotiate the debt. The need to renegotiate is occasioned by the debt-overhang problem, and renegotiating is costly due to the presence of small creditors who hold out and ride free on the benefits of the restructuring. These benefits to holdout creditors, however, can be realized in present value by equity when the debt is issued, and the pattern of payoffs public debt gives rise to make it attractive under asymmetric information. Since holdout public debtholders benefit at the expense of other claimants in financial distress, firms with private information that are unlikely to encounter such problems in the future issue public debt to minimize the costs of adverse selection. Thus, public debt has an important role in firms' capital structures despite the evident disadvantages of its inflexibility in financial distress. The model also makes predictions about the postworkout capital structure of the firm, and the relative yields of public and private debt. It suggests that innovations that increase the flexibility of public debt in renegotiation, and thus appear value-enhancing, may not be adopted because they reduce the role of the security in credible transmission of information.

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GRENADIER, STEVEN R., and ALLEN M. WEISS, *Optimal Migration Strategies for Firms Facing Technological Innovations: An Option Pricing Approach.*

Using an option pricing approach, this paper develops a model of a firm's optimal investment strategy when confronted with a sequence of technological innovations. There are several key features of the model. First, successive innovations of technology are stochastic in both their arrival times, as well as in their profitability. Second, we incorporate the feature of "learning by doing" in that firms choosing to adopt a current innovation become better able to reap the benefits of future innovations. Third, rather than assuming that current innovations disappear when newer innovations arrive, our model more realistically assumes that the previous generation of technology remains a viable market alternative, perhaps at a discounted cost. These features of the model induce a "path dependency" into the firm's operating options; two firms facing the same choice will choose differently because of past adoption decisions. The model yields four potential migration strategies: the Compulsive strategy, where firms adopt every innovation; the Leapfrog strategy, where firms bypass the current innovation, but adopt the future innovation; the Buy-and-Hold strategy, where firms adopt the current innovation, but fail to cash in on their learning by doing; and the Laggard strategy, where firms bypass the current innovation, but adopt it later when the future innovation emerges. The model provides closed-form solutions for the probability that each strategy will be adopted. We then analyze the impact of key underlying variables and distinguish the factors which drive one strategy to dominate another. These implications are discussed and compared with observed firm behavior.

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GROSSMAN, SANFORD, *Dynamic Asset Allocation and the Informational Efficiency of Markets.*

Markets have an allocational role; even in the absence of news about payoffs, prices change to facilitate trade and allocate resources to their best use. Allocational price changes create noise in the signal extraction process, and markets where such trading is important are markets in which we may expect to find a failure of informational efficiency. An important source of allocational trading is the use of dynamic trading strategies caused by the incomplete equitization of risks. Incomplete equitization causes trade. Trade implies the inefficiency of passive strategies, thus requiring investors to determine whether price changes are informational or allocational.

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GRÜNBICHLER, ANDREAS, and FRANCIS A. LONGSTAFF, *Valuing Futures and Options on Volatility.*

This paper presents simple closed-form expressions for volatility futures and option prices and examines their implications for the characteristics of these securities. We show that the properties of these volatility derivatives are fundamentally different from those of conventional option and futures contracts. This analysis also provides insights into the role that volatility derivatives may play in managing and hedging volatility risk in financial markets. Futures and options on volatility allow investors to hedge directly against shifts in volatility. These securities enable investors to avoid the costs of dynamically adjusting positions for changes in volatility. The model we use captures many of the observed properties of volatility. It allows volatility to be mean-reverting and conditional heteroskedastic.

Our result is unaffected by whether V can be expressed as a nonlinear function of other security prices. This is because V cannot be replicated by a self-financing portfolio of the option and the index, even though a non-self-financing portfolio can be constructed that replicates V exactly. Longer-term volatility futures and options may be less effective in hedging and managing volatility risk than commonly believed. The underlying reason for this is that mean-reversion dampens the effect of current shocks in volatility in the option and futures price. These results have many important implications for the design of volatility derivative products.

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GUEDES, JOSE, and TIM OPLER, *The Determinants of the Maturity of New Corporate Debt Issues.*

This paper documents the determinants of the maturity of 6,261 new corporate debt issues from the 1983 to 1993 period. We find that larger firms and those with high credit ratings are the most likely to issue very long-term debt (term to maturity of 30 years or more). They are also the most likely to issue very short-term debt (term to maturity of less than five years). This is consistent with Diamond's (1991a) argument that poor quality firms do not have access to the long-term debt market because of moral hazard problems. In addition, we find that highly-rated firms with strong growth prospects tend to issue shorter term debt. This fact, coupled with a tendency of firms to match maturities of debt to the maturity of assets is consistent with Myers' (1977) view that firms can control the agency problems of debt by shortening debt maturity. We do not find strong support for tax and signalling models of the optimal maturity of corporate debt issues.

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HANSCH, OLIVER, NARAYAN NAIK, and S. VISWANATHAN, *Trading Profits, Inventory Control, and Market Share in a Competitive Dealership Market.*

This article examines the trading profits, inventory control, and market share of the dealers competing for business on the London Stock Exchange. It analyzes the time series of inventories of market makers on the London Stock Exchange and finds

strong support for the inventory control hypothesis. It shows that a strong relationship exists between dealers' inventories and their quote posting behavior. It observes that market makers who offer better prices, in general, obtain a larger proportion of the order flow. Finally, we show that market makers' trading profits show substantial cross sectional variation and that this cross sectional variation in trading profits can be explained by the dealer's relative risk taking, but not by their market share of the business.

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HARRIS, LAWRENCE E., *Optimal Dynamic Order Submission Strategies in Some Stylized Trading Problems.*

Order submission strategy is the most important determinant of execution quality that investors directly control. Traders must decide when to submit market orders and when to submit limit orders. When they submit limit orders, they must know where to place their limit prices. If their limit orders do not execute, they must know when and how to resubmit their orders. This risk affects the original order submission decision.

These decisions affect the demand for and supply of liquidity. Most existing studies analyze market liquidity by assuming that only market-makers supply liquidity. In practice, public investors also supply liquidity when they submit limit orders. Since public investors demand liquidity when they submit market orders and supply liquidity when they submit limit orders, market liquidity depends on their order submission strategies.

The benefits and risks associated with an order strategy depend on the specific trading problem the trader must solve. Traders who face early deadlines and traders who believe that they have material information that will soon become public are impatient to trade. They use market orders or aggressively priced limit orders. Conversely, value-motivated traders may be willing to wait until profitable trading opportunities arise. These traders place limit orders far from the market to represent their interests when they are unable or unwilling to continuously monitor the market.

This paper derives optimal dynamic order submission strategies for trading problems faced by three stylized traders: an uninformed precommitted liquidity trader, an informed trader, and a value-motivated trader. These three stylized trading problems capture most essential elements of the actual trading problems practitioners encounter when trading small orders. The results help characterize the relation between time and price in the search for liquidity. The paper thus provides a more complete understanding of the value of immediacy. Separate solutions are obtained for quote- and order-driven markets. It is never optimal for the public to submit a limit order to a pure dealer market. The paper also examines how brokers form their order submission strategies when their customers evaluate their performance using various transaction cost measurement methods. Transaction cost measurement methods based on implementation shortfall dominate other methods.

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HASBROUCK, JOEL, *One Security, Many Markets: Determining the Contributions to Price Discovery.*

When homogeneous or closely linked securities trade in multiple markets, it is often of interest to determine where price discovery (the incorporation of new information) occurs. This paper suggests an econometric approach based on an implicit unobservable efficient price common to all markets. The information share associated with a particular market is defined as the proportional contribution of that market's innovations to the innovation in the common efficient price. Applied to quotes for the thirty Dow stocks, the technique suggests that preponderance of the price discovery takes place at the NYSE (a median 92.7 percent information share).

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HE, HUA, WILLIAM P. KEIRSTEAD, and JOACHIM REBHOLZ, *Double Lookbacks.*

In this paper we introduce and analyze a new class of options, *double lookbacks*, where the payoffs depend on the maximum and/or minimum prices of one or two traded assets. This class of double lookbacks includes calls and puts, with the underlying being the difference between the maximum and minimum prices of one asset over a certain period, and calls or puts with the underlying being the difference between the maximum and/or minimum prices of two correlated assets over a certain period. We derive analytical expressions of the joint probability distribution of the maximum and minimum values of two correlated geometric Brownian motions. This analytical solution is obtained by solving a two-dimensional Kolmogorov backward equation with some appropriately specified boundary conditions. We find that the joint probability distribution function can be expressed in terms of an infinite sum of Bessel functions. A two-dimensional Fokker-Planck equation and a two-dimensional method of image approach are also introduced to illustrate alternative ways of deriving the joint probability distribution of the maximum and/or minimum values of the two correlated Brownian motions. Once the distribution function is found, a simple numerical integration can then be performed for the valuation of double lookbacks. We provide numerical results that compare the prices of double lookbacks to those of standard lookbacks on a single asset. Finally, we point out that the distribution function derived for double lookbacks can be easily used to price double barrier options; i.e., calls or puts written on asset one subject to the prices of asset one and asset two never hit certain boundaries before the expiration date.

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HEBNER, KEVIN J., and YOUNGSEOG PARK, *Brokerage Commissions and Margin Requirements: With Special Reference to Japan.*

In Japan, brokerage commissions and margin requirements are currently regulated by the Ministry of Finance; however, commissions may soon be deregulated. This paper examines several economic factors that determine commissions and margins in a deregulated environment. The analysis is motivated by the observations that, for Japan's securities companies: brokerage commissions constitute a large component of their revenues; margin transactions account for a significant proportion of their trading volume; their gross income exhibits a great deal of volatility; income tax is one of their two largest expenses; and they face a significant tax asymmetry.

Executing an unmargined long transaction for a customer is a riskless activity; however, executing either a margined long or a short transaction exposes the firm to some risk and possibly negative profits. While the commission charged by a brokerage firm for executing a riskless (unmargined) long transaction is simply equal to the marginal cost of producing x transactions, it is demonstrated that the gross commission charged for executing either a margined long or a short transaction includes two other components. The first additional component is a risk/tax premium that is determined by the brokerage firm's tax rate and degree of tax asymmetry; the security's volatility and portfolio correlation; and the customer's total portfolio value and margin deposit. The second additional component is the premium required for the implicit put option associated with a margined long transaction, or for the implicit call option associated with a short transaction. The option falls in-the-money if the security's price changes significantly, so that it is optimal for the customer to default on his contract with the brokerage firm.

The determinants of the customer's optimal margin, for both long and short transactions, are also examined. The benefit to the customer of depositing a higher margin is that his commission cost declines. For example, with short transactions a higher margin increases the exercise price of the implicit call option, causing both the risk/tax premium and the implicit option premium to decline. However, a higher margin may increase the customer's opportunity cost of capital. Consequently, the optimal margin increases with the firm's tax rate and degree of tax asymmetry, and decreases with the customer's total portfolio value and his opportunity cost of capital. Increases in the security's volatility or portfolio correlation have ambiguous impacts on the optimal margin.

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HELWEGE, JEAN, and NELLIE LIANG, *Is There a Pecking Order: Evidence from a Panel of IPO Firms.*

Myers (1984) and Myers and Majluf (1984) posit that asymmetric information problems cause firms to follow a pecking order when choosing the source of funds for new investment. Internal funds are preferred to external funds, and if external funds are obtained, safer instruments will be offered before risky ones. The empirical evidence to date has produced indirect evidence that mostly supports this theory, but, with many predictions that overlap those of a static tradeoff model, conclusions are difficult to draw. In this paper we examine the decision to obtain external financing, and when obtained, the type of financing, for a group of firms that completed initial public offerings in 1983. We investigate the security offerings of these firms over the decade between 1984 and 1993 using a multinomial logit model to determine if firms follow the pecking order. The array of financing choices made by these firms is rich—we observe straight and convertible bond offerings, private debt, and common equity offerings, as well as firms that never access any capital markets after their IPOs. In contrast, other studies typically examine older, established firms for which the pecking order collapses to a choice of internal funds or debt. Moreover, we expect that asymmetric information problems will be greater among the IPOs, and will likely decline as the firms age.

We conclude from our investigation that firms do not obtain external funds based on their cash flow. Allowing for the possibility that weak firms with cash deficits are unable to tap the capital markets does not increase the predictive power of the deficit variable, although it does reveal that firms running a surplus do not borrow more. Among firms that obtain funds externally, we have determined that firms do not follow the pecking order. Frequently, the same variables affect the decision to issue public debt and public equity in the same direction, if not with the same magnitude. This suggests that public security offerings are much closer by nature than internal funds and private debt, which is counter to the pecking order theory.

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HESS, ALAN C., and AVRAHAM KAMARA, *The Term Premium: Default, Liquidi and Interest Rate Risks.*

We combine three strands of economic theory: the term structure literature, the market microstructure literature, and the net hedging pressure literature to create a unifying framework for studying the interest rate term premium. We provide a new interpretation of the term premium. Most researchers compute the term premium by comparing implied forward rates calculated from the spot Treasury yield curve to subsequently observed spot rates. The common view is that the term premium is an interest rate risk premium. This view assumes that secondary Treasury markets are free from trading frictions and that short positions (required to create forward contracts) in Treasury securities are default-free. We relax these assumptions and provide evidence that the term premium calculated from the spot Treasury yield curve contains default and liquidity (immediacy) risk premiums in addition to an interest rate risk premium.

In contrast, owing to their clearing association and market structure, futures Treasury bill rates do not contain default risk and contain a significantly smaller liquidity premium than implied forward rates. We compare the spread between the 3-month implied forward rate and the subsequent spot rate, and the corresponding spread between the 3-month futures rate and the subsequent spot rate. Our central finding is that 41 basis points of the mean term premium of 46 basis points calculated using implied forward rates are premiums for secondary market default and liquidity risks. The average interest rate risk premium using futures rates is 5 basis points and is not statistically different from zero. Our second finding is that most of the time variation in the term premium is due to the interest rate risk premium and forecast error.

The futures term premium provides stronger support for economic theory than the forward term premium. The interest rate risk premium in the futures term premium covaries positively with interest rate volatility and negatively with measures of predicted economic activity and the level of interest rates. The interest rate risk premium also covaries with the net hedging position in the futures market. It is higher when hedgers are net short than when they are net long.

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HESTON, STEVEN L., *A Model of Discontinuous Interest Rate Behavior, Yield Curves, and Volatility.*

This paper develops an equilibrium model in which interest rates follow a highly discontinuous (generalized) gamma process. The gamma process takes an infinite number of "small" jumps in every interval, and includes the Wiener process as a limiting case. The gamma interest rate model produces yield curves that closely resemble those of diffusion models. But in contrast to diffusion models, the curvature of the yield curve does not directly depend on the true volatility of the interest rate process, but instead depends on a different risk-neutral volatility. The gamma model appears to fit the distribution of interest rates changes and the jump characteristics of interest rate paths. Empirical tests reject a diffusion model of interest rates in favor of the more general gamma model because daily interest rate innovations are highly leptokurtic.

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HIEMSTRA, CRAIG, and JONATHAN D. JONES, *Another Look at Long Memory in Common Stock Returns.*

We apply Lo's (*Econometrica*, 1991, 59, 1279–1313) modified R/S test to the returns series of 1,952 ordinary common stocks. We use asymptotic and bootstrapped critical values to evaluate the significance of the test statistics, which are computed for several different fixed and sample-size dependent autocovariance lag-truncation lengths. In contrast to the findings of Greene and Fielitz (*Journal of Financial Economics*, 1977, 4, 339–349), the results of the application indicate that long memory is not a widespread phenomenon influencing the returns series of common stocks. We confirm this conclusion by testing for long memory using an alternative approach developed by Geweke and Porter-Hudak (*Journal of Time Series Analysis*, 1983, 4, 221–238). We also employ logit models to study the probability of a rejection of Lo's short-term dependence null by the modified R/S test. The results from our logit study indicate that the event of a rejection by the test is linked to short-lived firms that eventually merge, to firms in the communications, transportation, and utilities industries, and to firms that bear relatively little market risk. The maximal moment of a stock's return distribution is also found to influence the event of a rejection. Some of the results from our logit study lend empirical support to the theoretical work of Brown, Goetzmann, and Ross (unpublished manuscript, 1993, Graduate School of Business, Columbia University) who show that the rescaled range test is sensitive to survivorship bias.

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HIRSHLEIFER, DAVID, and IVO WELCH, *Institutional Memory, Escalation, and Investment Decisions.*

This paper examines how loss of institutional memory affects escalation of initial project investments. In our setting managers rationally try to maximize the value of a firm faced with sequences of similar investments with increasing costs. Owing to regular manager turnover and limited communication, there are repeated memory losses. New managers observe previous project choices but do not know the rationale for these actions. This memory loss can lead to repeated escalation of initially mistaken decisions. The firm undertakes extreme extensions of the initial project with higher probability than would a firm with perfect memory. Similarly, a firm tends to escalate rejections even as costs decline.

The intuition for this slippery slope to extremism is as follows. A new manager infers positive information about his project from past adoptions of similar ones. If he could observe past signals, he would know whether past adoptions were based upon a strong or mild preponderance of evidence. This would generate a range of possible beliefs, some close to the borderline of rejecting. An inability to observe past signals compresses these beliefs toward an average which (if the new project cost is not too high) mildly supports adoption, making adoption more probable. Once adopted, the beliefs of the next manager are again compressed, predisposing him to adopt at even higher costs.

If projects are adopted too often, why can't a manager rationally adjust by rejecting more often? His behavior is like that of an electorate under a gerrymander redistricting scheme that stacks a landslide majority for Blue Party in one district, so that Green Party can win by modest majorities in many districts. Similarly, observing past actions but not signals shifts the distribution of possible information sets such that relatively frequently there is a *mild* preponderance of evidence in favor of adoption, balanced relatively infrequently by states with *strong* evidence against adoption. Thus, frequent escalation is rational.

The model is consistent with various forms of escalation and policies designed to constrain escalation. In the context of project adoption, these phenomena include escalation of investment in failing divisions, the sunk cost effect, and the undervaluation of strategic options. In the labor market context, these phenomena include retention of deadwood employees, now-or-never promotion, and the Peter Principle of overpromotion.

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HOLLIFIELD, BURTON, and RAMAN UPPAL, *A Test of Uncovered Interest Rate Parity in Segmented International Markets.*

One of the most studied relations in international finance is that between forward exchange rates and future spot rates. Empirical tests typically find that when one regresses changes in the spot rate on the forward premium, the regression slope coefficient is always less than one and often negative. In this paper, we examine the effect of segmented commodity markets on the relationship between the forward exchange rate premium and the change in the future spot rate in a general equilibrium model. Market segmentation, modeled by introducing a proportional cost for transferring physical goods between countries, generates deviations from purchasing power parity. This focus on the imperfection in the real sectors distinguishes our work from existing studies. Our work includes a theoretical analysis of the effect of segmentation on the forward bias, numerical calibration of the model, and empirical tests of the implications of the model.

We derive in closed form the functional relation between changes in the spot exchange rate and the forward premium in this model with market segmentation. Solving numerically a calibrated version of the model, we find that, consistent with existing empirical work, the theoretical regression coefficient from regressing changes in the nominal spot rate on the forward premium is less than unity, but not negative. We test the reduced form relations, derived from the general equilibrium model, on monthly exchange rate, inflation, and ex-ante interest rate data from four countries. We find that, when using an instrument set containing both nominal and real returns, the model is rejected by the data. However, the additional explanatory variables suggested by our model do explain some of the predictable deviations from uncovered interest rate parity.

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IKENBERRY, DAVID, JOSEF LAKONISHOK, and THEO VERMAELEN, *Market Underreaction to Open Market Share Repurchases.*

The literature is rich with reasons why companies repurchase their own stock, ranging from signalling to being a substitute for cash dividends. Yet managers typically do not mention these reasons. Instead, they frequently claim that the repurchase is motivated because prevailing market prices "undervalue" the stock and that it is a "good investment." Despite this public endorsement, the average market response to the news of an open market share repurchase is only 3.5 percent. Such a small reaction seems inconsistent with the undervaluation theme managers often voice. We examine long-run firm performance following open market share repurchase announcements during the period 1980 to 1990. Using a buy-and-hold strategy, four-year abnormal performance following the announcement is more than 12 percent. When the announcement and long-run returns are combined, the magnitude of the total undervaluation is about 15 percent, a level more consistent with managers' claims of mispricing.

However, even though undervaluation is an important reason motivating share repurchases, other reasons also exist. To distinguish undervaluation from these other factors, we sort firms on the basis of book-to-market ratios. Repurchases announced by firms with high book-to-market ratios are more likely to be driven by undervaluation, while those with low ratios may be motivated by other reasons. Our evidence suggests that this is indeed the case. Firms with relatively high book-to-market ratios, or "value" stocks, have four-year abnormal performance of 45.3 percent following the repurchase announcement. This occurs using a benchmark that explicitly controls for size and book-to-market effects in stock returns. For repurchases announced by firms with low book-to-market ratios, or "glamour" stocks, no positive drift in abnormal returns is observed. Thus, at least with respect to value stocks, the market errs in its initial response and appears to ignore much of the information conveyed through repurchase announcements. This paper adds to a growing body of literature including, for example, equity offerings, proxy fights, mergers, spinoffs, and, in a related context, fixed-price tender offers, which find that the market reaction to news is not always completed over short time periods. The full impact of some corporate announcements can extend over several years.

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JO, HOJE, JOHN M. PINKERTON, and ATULYA SARIN, *Usage of Convertible and Warrant Bonds by Japanese Firms: Risk-Shifting or Delayed Equity.*

Jensen and Meckling (1976), Green (1984), and Titman and Wessels (1988) argue that convertible securities are issued by firms to reduce agency conflicts between bondholders and stockholders. An alternate explanation has been proposed by Stein (1992). He argues that corporations use convertibles when debt issue may lead to costly financial distress, and informational asymmetries (as in Myers and Majluf (1984)) make a conventional stock issue unappealing. Thus convertible securities represent an indirect mechanism for implementing equity financing that mitigates the adverse-selection costs associated with direct equity sales. In this paper, we integrate these two main hypotheses, *risk-shifting* and *delayed equity* financing, into a single testing framework in order to empirically determine the relative importance of these alternative explanations as the primary reason for companies using convertible securities.

The popularity of equity-linked debt instruments in Japan where institutional arrangements mitigate the incentives to transfer wealth from bondholders to stockholders seems inconsistent with the *risk-shifting* explanation. Also the probability of choosing convertible securities over common equity is not positively related to the potential to transfer wealth from the bondholders to the stockholders. Similar results are obtained when we examine convertible debt ratios. However, we find evidence consistent with Stein's (1992) argument that firms use convertibles to delay equity when they have favorable information about the firm. The price increases preceding and following convertible issues and convertible usage is positively related to offering size and growth opportunities as predicted by Stein (1992). Overall, our findings support the *delayed-equity* explanation for Japanese firms issuing convertibles, but provide little support for the *risk-shifting* hypothesis.

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JOHN, KOSE, and APRIL KLEIN, *Shareholder Proposals and Corporate Governance.*

Shareholder-sponsored proposals are studied focusing on those seeking changes in corporate governance and the incentive structure of managers. We hypothesize the shareholder proposal to be a tool of shareholder activism, which is more likely to be initiated when outsider shareholders (individual or institutional) believe that the internal and external control mechanisms in place are not functioning properly. Using proxies for weak control mechanisms and poor firm performance, we test hypotheses on the determinants of: (1) the likelihood of a corporate governance proposal being made, and (2) the votes it obtains. Our sample contains 334 proposals made by shareholders of 485 of the S&P 500 firms between July 1, 1991 and June 30, 1992. We find that likelihood of a firm being the target of one or more corporate governance proposals to be positively and significantly affected by size of the firm, presence of negative net income, percentage of outside directors with outside directorships in other S&P 500 firms, whether or not shareholders vote on the choice of auditor, and the votes obtained by last year's proposals. The percentage of institutional ownership had a negative and significant effect on the incidence of shareholder proposals.

We also examine the determinants of the likelihood of different types of proposals. For example, we find that the presence of staggered boards and poison pills, and the percentage of outside board members who are on the boards of other Fortune 500 firms increase the likelihood of governance proposals pertaining to antitakeover provisions. The firm being in a state (of the United States) considered to be hostile to takeovers reduces the likelihood of such proposals. The salary of the board of directors is a factor (in addition to firm size and the presence of negative income) that significantly and positively affects the incidence of shareholder proposals seeking changes in the board structure. The size of the firm, net income, and the presence of interlocking boards are associated with the likelihood of shareholder proposals seeking changes or additional disclosures in the firm's executive compensation structure. In our study of factors that increase the likelihood of a particular type of proponent to propose shareholder proposals, we find other interesting relationships. For example, pension funds seem to target large firms with poor stock return performance that have large institutional ownership. On the other hand, the United Shareholders Association, a shareholder activist group, seems to target firms with a large fraction of prominent outside directors, and one or more restrictive features (poison pills, staggered boards, no confidential voting, and golden parachutes).

We find the percentage of favorable votes to be significantly and positively related to the percentage of institutional ownership, whether or not it was a common proposal, and whether or not it was a proposal related to repealing an antitakeover measure or related to shareholder voting. The fraction of favorable votes was negatively influenced by firm size, past cumulative stock returns, total ownership of directors, and whether or not the proposals were related to seeking changes in the board of directors. The identity of the proponent also had a significant impact on the favorable votes obtained, e.g., proposals by Gilbert brothers, pension funds, and the United Shareholders Association elicited significantly higher votes than did other proponents.

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JONES, CHARLES M., and GAUTAM KAUL, *Oil and the Stock Markets.*

In this paper, we assess the impact of oil price shocks on international stock markets. Within the context of the log-linear dividend/cash flow valuation model, we test whether an aggregate stock market's reaction to oil shocks in the postwar period can be justified by current and future changes in aggregate real cash flows and/or financial variables that are often used to proxy for changes in expected returns.

We show that the evidence is consistent with the hypothesis that the U.S. and Canadian stock markets are rational: the reaction of stock prices to oil shocks can be completely accounted for by the impact of these shocks on current and future real cash flows alone (even without explicitly accounting for oil-induced changes in expected stock returns). In contrast, we are unable to explain the reaction of the Japanese and the U.K. stock markets to oil shocks in the postwar period. In both countries, innovations in oil prices cause stock prices to change more than can be justified by subsequent changes in real cash flows or by changes in other expected return variables. Therefore, we conclude for these countries that either oil price shocks impact expected stock returns in a way that is not captured by our proxies for expected returns, or the Japanese and U.K. stock markets overreact to oil price shocks.

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JONES, JONATHAN D., J. HAROLD MULHERIN, and SHERIDAN TITMAN, *Speculative Trading and Stock Market Volatility.*

Our analysis of speculation and volatility is motivated by the existing ambiguity in the inferences to be drawn from the well-documented association between volatility and trading volume. While the volatility-volume relation arguably reflects the assimilation of information into securities prices, it could also indicate the presence of noise traders who induce excess volatility into market prices. The concern about the effect of speculative noise traders has surfaced following both the 1929 Crash and the more recent 1987 Market Break. To address such policy concerns, our research presents tests that distinguish between the information and noise explanations of stock return volatility.

Our research design offers several improvements over prior empirical work in the field. We use a lengthy time period spanning 1919 to 1987 to capture the dynamics of the stock market throughout the better part of the 20th century and to facilitate an examination of the sensitivity of the results to particular time periods. We estimate volatility from daily stock return data to avoid the spurious findings often obtained from overlapping monthly data. Most importantly, we decompose our data on trading volume into proxies for noise trading and for information-driven volume.

Our decomposition of trading volume entails modelling noise trading in first stage regressions where predicted volume proxies noise trading and unexpected volume represents information innovations. In the first stage regressions, we employ two general empirical models of predicted volume: (1) to capture the herdlike aspect of noise traders, we regress trading volume on lagged volume; (2) to capture the concept that noise traders are more sensitive to trading costs, we regress volume on variables such as brokerage commissions. We then regress stock return volatility on the decomposed estimates of noise trading and information innovations to discern the source of market volatility.

Our analysis finds no destabilizing effect of speculative noise trading in the post-World War II period or in the period prior to the 1929 Crash. We do, however, find evidence of a relation between speculation and volatility during 1934 to 1946, a period in which prior research has found significant mean reversion in stock returns. The lack of a consistent relation between volatility and our measures of noise trading, especially in recent years, is inconsistent with the notion that policies that increase the cost of trading will reduce volatility, and instead supports the observation of Alfred Marshall that "Hasty attempts to control speculation by simple enactments have invariably proved either futile or mischievous."

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JONES, STEVE, WILLIAM MEGGINSON, ROBERT NASH, and JEFFRY NETTER, *Share Issue Privatizations as Financial Means to Political and Economic Ends.*

This paper analyzes the use and terms of "share-issue privatizations" (SIPs) during the period 1961 to 1994. A SIP involves the privatization of a "state-owned enterprise" (SOE) via a public offering of shares. We begin by presenting a theory of SIPs that implies their terms are designed so as to build the political support necessary to privatize a SOE. We then investigate the extent to which the terms of the SIPs, in our sample, deviate from the terms observed in the share offerings of publicly-held corporations, and we consider the nature of the political provisions we detect in these SIPs.

Our sample includes 168 SIPs made by 137 companies from 34 countries that have a total value of over a quarter of a trillion dollars. SIPs have been used almost exclusively in democracies and are especially concentrated (in terms of numbers) in Europe. SIPs have occurred in a variety of different industries, and they tend to be very large. They also tend to involve restrictions on foreign ownership (although foreigners are often allocated a fraction of the issue) and include allocations to employees. Further, the governments initiating the SIPs often retain control restrictions or veto control over changes in the structure and ownership of the privatized firm. However, the SIPs are designed to establish an ownership structure that discourages the state's interference in the firm's ordinary course of business.

We also document that the SIPs are significantly underpriced such that the initial returns are greater for initial (and unseasoned) SIPs than for subsequent (and seasoned) SIPs. Cross-sectional regressions, designed to explain this underpricing, detect an inverse relation between initial returns and foreign allocation. This result suggests that to the extent it is necessary to allocate shares to foreign investors (so as to enhance liquidity or improve monitoring), the issuing government will be adverse to underpricing the SIP. This is because underpricing to foreign investors is a wealth transfer to nonconstituents. The weight of the evidence suggests that both political and economic objectives influence the terms of SIPs in ways that are consistent with the evolution of adaptively efficient economic institutions.

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KANATAS, GEORGE, and JIANPING QI, *Underwriting by Commercial Banks: Conflicts of Interest versus Scope Economies.*

This paper examines the conflict of interest problem arising from underwriting by banks of their borrowers' securities. In our model, these banks have an incentive to have their poor quality borrowers issue securities to repay their bank loans. Consequently, the intermediaries' certification of security issues is not credible, and high quality firms seeking to issue securities are pooled with those of lower quality, resulting in suboptimal investment. We show, however, despite the expected costs associated with this conflict of interest, firms may nevertheless prefer to use such an intermediary for both lending and underwriting because of scope economies. In essence, the tradeoff between the conflict of interest costs and the savings from scope economies determines firms' choices of lenders and underwriters.

Contrary to widely held beliefs, we also show that reputational concerns of the intermediary may fail to mitigate the conflict of interest problem. In particular, we find that the conditions for the intermediary to successfully form such a reputation are restrictive. Unless *both* the savings from scope economies and the opportunity costs of suboptimal investment are sufficiently large, no intermediary may be able to secure the rents that are necessary to maintain the reputation, regardless of where or how the reputational rents (or quasi-rents) may be generated. Finally, we argue that governmental subsidies to the banking system would not mitigate the conflict of interest problem if they are uniformly applied to all lending intermediaries.

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KAPLAN, STEVEN N., and RICHARD S. RUBACK, *The Valuation of Cash Flow Forecasts: an Empirical Analysis.*

This paper compares the market value of highly leveraged transactions (HLTs) to the discounted value of their corresponding cash flow forecasts. Sufficiently detailed forecasts are provided by management to investors in 52 HLTs completed between 1983 and 1989. We use the cash flow forecasts to estimate the cash flows that will accrue to all capital providers, including different classes of debt and equity; to estimate tax liabilities (and interest tax shields); and to estimate a terminal value when the cash flow information ends. We discount the capital cash flows and terminal values with discount rates obtained from three CAPM-based approaches corresponding to firm level, industry level, and market level measures of risk. These valuations generally parallel the basic techniques taught in most business schools. The paper reports a strong relation between the market value of the sample HLTs and the discounted value of their corresponding cash flow forecasts. The median estimates of discounted cash flows are within 10 percent of the market prices of the corporations involved in the transactions. And the discounted cash flow estimates perform at least as well as (using mean squared errors and other criteria) valuation approaches based on companies in similar industries and companies involved in similar transactions.

In the second part of the paper, we invert the analysis and estimate the risk premium implied by transaction prices and forecast cash flows. The median implied risk premium, the amount by which the implicit discount rate exceeds the long-term Treasury bond rate, is 7.10 percent. (This result is, however, sensitive to the assumed growth rate of 4 percent for the terminal value. The implied risk premium equals 4.91 percent with no terminal value growth.) Finally, we examine the relation of the implied risk premium to firm level betas, industry level betas, firm size, and (pretransaction) firm book-to-market ratios. The implied risk premium is modestly related to firm and industry betas, but not to firm size or book-to-market ratios.

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KAROLYI, G. ANDREW, *Stock Return Volatility Around Expiration Days in Japan.*

This study evaluates the impact of stock trading activity around expirations of Japanese stock index options and futures contracts on the underlying stock prices. Although these expiration days are associated with higher than average trading volume, tests indicate that the intraday return volatility in the last hours of trading on expiration days and the first hours following expirations is only marginally greater than that on nonexpiration days. Moreover, portfolio return reversals of 0.1 percent or less during the last hour of trading at expiration and the first hours of trading following the expiration are statistically insignificant and smaller in magnitude than typical bid-ask spreads, commission rates, and market impact costs would warrant. Finally, in comparing the expiration effects for the two similar Nikkei index futures contracts traded in the Singapore and the more-heavily-regulated Osaka/Tokyo markets, no important differences can be discerned. The implications of these findings for existing and proposed restrictions on index arbitrage activity by Japan's Ministry of Finance and the Tokyo Stock Exchange are discussed.

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KHANNA, NAVEEN, and ANNETTE B. POULSEN, *Managers of Financially Distressed Firms: Villains or Scapegoats.*

In this paper, we provide evidence concerning the extent to which managers are to blame when their firms become bankrupt. We study a sample of firms that end up in severe financial distress to determine the actions taken by firms' managers as their financial positions worsen. We compare the sample of firms that eventually experience severe financial distress (filing for Chapter 11 bankruptcy protection) with a control sample of firms that performed better. We suggest that the comparison provides evidence on the way managers act as their firms sink into financial trouble and the extent to which financial distress is the result of incompetence or excessively self-serving managerial decisions or due to factors outside of management's control.

We find that managers of Chapter 11 firms and the control firms make very similar decisions and that, on average, neither set of managers is perceived to be taking value-reducing actions. We also find that when managers are replaced in the firms that eventually file for Chapter 11 protection, the market does not respond positively. These findings support the idea that financial distress is due to conditions outside of the control of managers, or that the managers are serving as scapegoats.

The active market for corporate control, including the explosion in the number of mergers, proxy contests, and hostile takeovers in the 1980s, suggests that there are poor managers in many corporations. However, even though the Chapter 11 firms are in severe financial distress, it does not appear that their problems are "fixable"

through a corporate takeover. Overall, our results suggest that failure is not the result of managers making less competent decisions than their competitors or taking actions that are inconsistent with shareholder wealth maximization. As such, our results support Fama's (1980) claim that markets do a good job in screening out bad managers and in aligning managerial incentives with stockholder interests.

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KOEDIJK, KEES G., FRANÇOIS G. J. A. NISSEN, PETER C. SCHOTMAN, and CHRISTIAN C. P. WOLFF, *The Dynamics of Short-Term Interest Rate Volatility Reconsidered.*

In this paper we present and estimate a model of short-term interest rate volatility that encompasses both the level effect of Chan, Karolyi, Longstaff, and Sanders (1992; CKLS) and the conditional heteroskedasticity effect of the GARCH class of models. When compared with other existing models, our model—to which we shall refer as the KNSW model—exhibits a superior empirical fit. This feature results from a relatively flexible specification that allows different effects to dominate as the level of the interest rate varies.

The different models were estimated for monthly as well as for weekly data. We find that both GARCH effects and level effects are important determinants of interest volatility. The empirical results show that under all volatility specifications, the interest rate innovations exhibits fatter tails than the normal distribution.

The parameter that measures the sensitivity of interest rate volatility with respect to the interest rate level, γ, is highly significant. The main contribution of the KNSW model over the CKLS type specifications is the smaller estimate of γ. For the estimation of the interest rate sensitivity in the variance specification one can not ignore the strong GARCH effects in monthly and weekly data.

The most precise estimates of the volatility specification are obtained at the weekly frequency. The estimated value of γ ranges from 1.38 for the CKLS model for the monthly frequency under the normal distribution to 0.88 for the KNSW for the weekly frequency under the *t*-distribution. In fact, $\hat{\gamma}$ is not significantly different from 0.5, which is in accordance with the Longstaff and Schwartz (1992) and the Cox, Ingersoll, and Ross (1985) models.

Ignoring GARCH creates an omitted variables problem for the estimate of the level effect in the volatility. Estimation errors in γ are important, since this parameter is the most important determinant for pricing bond options.

As the volatility of the short-term interest rate is one of the determinants for the pricing of interest rate contingent claims, we investigate the implications of the dynamics of short-term interest rate volatility for the pricing of discount bond options. Our results suggest that the inclusion of a GARCH effect in addition to a level effect in the model specification is relevant for the pricing of short-term discount bond options.

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KOLE, STACEY R., *The Bundling of Compensation Contracts.*

Private negotiations between executives and the firm on executive compensation provide researchers, like shareholders, with little direct evidence on compensation contracting. Most of the existing literature on executive pay draws on actual remuneration in an attempt to infer the form of unobserved compensation contracts from received payments. In this paper, I focus on the period prior to contracting, when various institutional constraints impose limits on the types and terms of contracts that can be offered by the Board. Using publicly available information, I construct firm-specific menus of the forms of compensation that are available to the Board when negotiating compensation contracts. The richness of this ex ante data enable me to test theories predicting cross-sectional variation in incentive pay.

The contributions of this work are numerous. First, I draw on multiple forms of stock-based compensation (including stock options, restricted stock, and long-term performance plans) to test cross-sectional predictions on the choice of performance measures. Specifically, I test theoretical predictions of stock-based pay by examining whether firms have *any* mechanism for transferring equity to managers rather than the ability to grant a specific type of stock-based award. This represents a significant improvement over tests that employ a single stock-based plan (e.g., Smith and Watts (1992) and Gaver and Gaver (1993), which test the predictions of Smith and Watts using data on stock option plans). Second, much of the literature on executive compensation categorizes various types of remuneration as either sensitive to firm performance or performance-insensitive. By documenting differences in the terms of seemingly similar stock option and restricted stock plans, I show that this simple categorization ignores much of the richness of actual compensation contracting. I test theories on contract length and provide evidence that supports the use of longer-lived contracts in high R & D innovative firms. Third, by examining the use of explicit employment contracts, I provide the first large-sample evidence on the theories of implicit contracting. Finally, I document the formalization of contractual flexibility and provide evidence that firms employ this flexibility both when they operate in diverses lines of business and when there is uncertainty about the nature of future operations.

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KULATILAKA, NALIN, and ENRICO C. PEROTTI, *What is Lost by Waiting to Invest.*

We study investment timing under uncertainty and imperfect competition. The real options literature studies investment timing when (a) the firm has a monopoly over an investment opportunity, and (b) the product market is perfectly competitive. As a result, firms tend to postpone investment as uncertainty increases. We show instead that in a market with strategic competition, early investment endogenously confers a greater capability to take advantage of future growth opportunities. This strategic advantage leads to the capture of a greater share of the market, either by dissuading entry or by inducing competitors to “make room” for the stronger competitor. As a result of this growth option effect, payoffs are usually more convex than under the waiting-to-invest option. When this strategic effect is strong, increased uncertainty encourages immediate investment. The result is confirmed when we allow for simultaneous entry, and is robust to different forms of strategic interaction. Our results may be surprising in the light of current practice, which tends to view volatility as a strong disincentive for new investment. However, under strong strategic competition, higher uncertainty clearly presents greater opportunities than risks.

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LASFER, M. AMEZIANE, *Ex-Day Behavior: Tax or Short-Term Trading Effects.*

This study examines the behavior of share prices around the ex-dividend dates before and after the introduction of the 1988 Income and Corporation Taxes Act (ICTA) that changed substantially the tax differential between dividends and capital gains in the UK market. The reduction in the rate of the tax credit from 30 percent to 25 percent and the various provisions relating to the taxation of income and capital gains contained in the 1988 ICTA offer a unique controlled experiment to test for the impact of taxation on the behavior of share prices on the ex-dividend days. We hypothesize that, since the 1988 ICTA abolished the tax differential on dividend income and capital gains for the ordinary investor, ex-day tax premium should decline in the post-1988 period and even become negative to reflect the tax credit associated with the cash dividend received. We test this hypothesis using 10,123 ex-day events on the London Stock Exchange over the period April 6, 1985 to April 5, 1994.

Using various event study methodologies, we find that, on average, ex-day returns have decreased from nearly 0.50 percent in the 1985 to 1987 period to 0.30 percent in the post-1988 period. In contrast to expectations, however, ex-day returns were all positive and significant. Further analysis revealed that ex-dates are confounded with the beginning of the London Stock Exchange account, when returns are usually high to reflect the financing advantage brought by the new account period. After adjusting for settlement date effects, we find that ex-day returns in the pre-1988 period are still positive and significant, while the post-1988 period returns are negative and insignificant. This significant change over the two periods is apparent only in the high dividend yield groups. For the lowest dividend yield quintile, ex-day prices decrease by the full amount of the dividend in both subperiods. These results suggest that taxation affects ex-day share prices.

In contrast to US evidence, our results do not provide support for the short-term trading hypothesis. The post-1988 period ex-day returns are not affected by the commonly used measures of transaction costs, such as the bid-ask spread and trading volume. This suggests that short-term traders are either constrained by the anti-avoidance tax legislation and/or that the 1988 ICTA has eliminated any potential gains on dividend capture. Our ex-day returns are, also, not affected by the day of week, month of the year, type of dividend distribution, or number of days to the actual receipt of the cash dividend. We conclude that taxation is the only force that drives ex-day share prices in the United Kingdom.

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LAUX, PAUL A., and DEAN FURBUSH, *Price Formation, Liquidity, and Volatility of Individual Stocks around Index Arbitrage Trading.*

We identify and examine the individual stock trades spawned by S&P 500 Index arbitrage programs. Our purpose is to document the association between index arbitrage and the characteristics of stocks' price formation processes. In particular, we focus on changes in the stock-price impact of trades, the influence of the basis on stock prices, the bid-ask spread, and volatility.

In contrast to other studies that focus on pricing and liquidity at the time of the index arbitrage trade itself, we search for evidence of persistent changes in the way that individual stocks are prices following an index arbitrage event. This approach is made possible by the use of a unique database, which is created by identifying about 30,000 individual stock trades that were likely spawned by large S&P 500 Index arbitrage trades.

For S&P 500 stocks in various capitalization classes, we find a large reduction in liquidity (as documented by an increase in the price impact of trades) that persists for much of the remaining trading session. The influence of the futures-stock basis on stock prices is much reduced, and there are economically significant reductions in volatility. In contrast, the bid-ask spread is not much affected.

These results are consistent with recent theories of the influence of public information arrival on the incentive to collect and process private information. On average, an arbitrage stock trade completes a public information arrival event that begins with a change in the stock-futures basis: stock prices do not move persistently beyond the levels reached just after an index-arbitrage-spawned stock trade. The changes in stocks' price formation processes following this event are consistent with the proposition that the mix of information affecting stock prices shifts toward private information.

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LI, ANLONG, PETER RITCHKEN, and L. SANKARASUBRAMANIAN, *Lattice Models for Pricing American Interest Rate Claims.*

Heath, Jarrow, and Morton have provided a paradigm for pricing interest rate claims relative to the term structure. The paradigm mimics the Black-Scholes framework in that the only requirements are the underlying prices and their volatilities. In this case the "underlying" is the forward rate curve, and its level and volatility structure needs to be specified. For quite general volatility structures, the evolution of the term structure under the equivalent martingale measure is path dependent. Indeed, since the evolution may not be Markovian with respect to a finite dimensioned state space, difficulties arise in implementing models for pricing interest rate claims. Specifically, since lattice procedures grow exponentially, it currently is not possible to implement these models to price most long dated claims, even those as simple as callable coupon bonds.

This article establishes efficient lattice based algorithms for pricing American interest sensitive claims in the Heath, Jarrow, Morton paradigm, under the

assumption that the volatility structure of forward rates is restricted to a class that permits a Markovian representation of the term structure. The class of volatilities that permits this representation is quite large and imposes no severe restrictions on the structure for the spot rate volatility. The algorithm exploits the Markovian property of the term structure and permits the efficient computation of all types of interest rate claims. Specific examples are provided to show the rapid convergence of prices. The advantages of one specific model in the derived class over the popular Black-Derman-Toy model are documented.

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LONGSTAFF, FRANCIS A., and EDUARDO S. SCHWARTZ, *A Simple Approach to Valuing Risky Fixed and Floating Rate Debt.*

This paper develops a simple approach to valuing risky debt that incorporates both default risk and interest-rate risk. The approach also explicitly allows for deviations from strict absolute priority. In developing the model, our objective is to be able to provide tractable valuation models for risky debt securities. Accordingly, we present the simplest possible specification for the model rather than the most general. This has the important advantage of allowing us to derive simple closed-form expressions for both risky fixed-rate and floating-rate debt. These closed-form expressions provide a number of new insights about the properties of corporate debt prices.

We first apply our framework to value risky discount and coupon bonds. We show that the credit spreads implied by the model are consistent with many of the properties of actual credit spreads. For example, the model implies credit spreads comparable in magnitude to actual spreads and allows the term structure of credit spreads to be either monotone increasing or hump shaped. An important implication of our results is that credit spreads for firms with similar default risk can vary significantly if the assets of the firms have different correlations with changes in interest rates. This property of the model has the potential to explain why bonds with similar credit ratings but in different industries or sectors have widely-differing credit spreads. Finally, we show that the properties of high-yield bonds can be very different from those of less-risky debt. For example, the duration or interest-rate sensitivity of a high-yield bond may actually increase as it gets closer to its maturity date.

We then derive closed-form expressions for the value of risky floating-rate debt. We find that the price of a floating-rate bond can be an increasing function of the maturity of the bond in some situations. Similarly, the value of floating-rate debt can be an increasing function of the level of interest rates. These results illustrate that the properties of floating-rate debt are fundamentally different from those of fixed-rate debt. In general, the price of a floating-rate bond need not equal its par value even on coupon-payment dates because of the risk of default.

Using *Moody's* corporate bond yield averages, we examine whether the implications of our model are consistent with the actual properties of credit spreads. As implied by the model, we find that credit spreads are strongly negatively related to the level of interest rates. Furthermore, changes in interest rates account for the majority of the variation in credit spreads for most of the bonds in the sample. This drives home the importance of allowing for interest-rate risk in addition to default risk in valuing risky debt securities. We also find that the differences in the duration of bonds across industries and sectors is consistent with the differences in correlations with changes in the interest rate. These results provide supporting evidence for the empirical implications of our valuation model.

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LYONS, RICHARD K., *Optimal Transparency in a Dealership Market with an Application to Foreign Exchange.*

This paper shows that—from the dealer perspective—there is a tradeoff between information revelation and risk sharing. That is, in multiple-dealer markets like spot foreign exchange, greater transparency of trading increases the rate at which price reveals information at the same time it reduces dealers' ability to manage risk. The basis for this trading result is the more general fact that additional information ex ante can impede risk sharing.

We establish the result by solving a mechanism design problem built around the following question: Would risk-averse dealers prefer ex ante that order flow were observable? The answer is that the dealers' preferred mechanism (incentive-efficient) is one in which order flow is not generally observable. Rather, dealers prefer a trading mechanism that produces enough noise—via lower transparency—to slow the pace of revelation, which permits additional trading opportunities in advance of revelation. This allows dealers to lower the variance of unavoidable position disturbances, thereby reducing the marketmaking risk inherent in price discovery.

Our multiple-dealer trading model is intended to reflect trading in spot foreign exchange. This market is an apt target for our analysis since transparency is both endogenous (unregulated) and measurable. Interdealer trading accounts for roughly 90 percent of trading in this market. Accordingly, our model places special emphasis on inter-dealer trading. Another interesting property of the model is the role of transaction costs: a transaction cost is necessary to insure incentive compatibility of the mechanism. In other words, a transaction cost is necessary to protect the integrity of the information structure. This stands in contrast to traditional models in which the spread is determined by a zero profit condition with costs to providing immediacy (e.g., adverse selection, risk aversion, carrying costs, etc.).

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MAQUIEIRA, CARLOS P., and WILLIAM L. MEGGINSON, *Why Public Companies Begin Paying Dividends.*

This paper examines empirically whether the dividend initiation decisions of a sample of newly-public firms are best explained by the predictions of the Miller and Rock (1985) cash flow signalling model, or by the competing agency cost models presented by Easterbrook (1984), Jensen (1986), and Rozeff (1982). We match a sample of 108 firms that go public between 1980 and 1986, and that initiate cash dividend payments by year-end 1990, with another set of firms from the same industries that go public at the same time, but do not begin paying dividends by the end of 1990. In order to determine which hypothesis' predictions are supported most clearly, we compare financial and operating data from these matched samples to see how dividend-initiating (DI) firms differ from non-dividend-initiating (NDI) firms during the years before, coincident with, and subsequent to dividend initiation.

Our results strongly support the agency cost models. Specifically, we find little evidence of a surge in earnings after dividend initiation, as predicted by the signalling hypothesis. Instead, we document that DI firms are older, larger, more profitable, and have consistently higher levels of measured free cash flow at their initiation date than do NDI firms. In the years after initiation, the DI firms issue equity and convertible securities more frequently, have higher levels of free cash flow, and have lower levels of—and greater post-IPO reductions in—officer and director shareholdings than do the matching NDI companies. Asset growth rates are also consistent with the predictions of the agency cost of free cash flow model, in that these firms have slower growth rates and lower levels of marketing and capital expenditures than do NDI firms prior to initiation, but they have higher levels of liquid asset holdings afterwards.

We then verify these basic results using logit regression methodology to compare our DI firms with a randomly selected sample of newly-public firms (logit regression is not an appropriate econometric tool for use with matched samples). We find that the dividend initiation decision is directly related to the market value of equity at the initiation date, and negatively related to the need to fund capital expenditures. We also document significant, positive abnormal stock returns associated with dividend initiation announcements, and our cross-sectional analyses of these abnormal returns further support the agency cost hypothesis. Finally, we examine initial dividend payouts using regression methodology and obtain results very similar to those obtained with the logit estimations.

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MARGIOTTA, MARY M., *Executive Compensation and Corporate Ownership Structure: An Empirical Analysis.*

This paper examines the role that ownership concentration plays in determining both executive compensation and performance of large public firms. In particular, the effect that large outside blocks of stock, management holdings, and institutional holding have upon stock market performance and the form and amount of CEO compensation is examined.

Concentrated stock ownership has two potential effects. First, since a larger fraction of the returns from monitoring accrues to owners of large blocks, monitoring of management is more likely to be undertaken. Second, large blocks may be considered toe hold investments in the firm. The existence of such blocks make it easier and cheaper for a raider to acquire a firm that is poorly managed. Thus managers in firms with large blocks have incentive to manage the firm in a manner that maximizes the shareholders' welfare, resulting in a reduction of costs in such firms. The efficient contract offered to managers in this case would have lower average compensation since the risk premium that needs to be paid in order to induce proper effort would be reduced. Further, compensation would have less variability and be less sensitive to performance. The effect on stock market returns is less clear. It is assumed that in firms without large blocks, the agency problem is addressed through efficient contracts alone. These contracts may encourage managers to maximize the value of the firm and therefore, differences in the profitability of the firms across ownership structures may not be observed. To the extent that efficient contracts do not perfectly align the interests of managers with those of shareholders, performance may be lower in firms with less concentrated ownership.

These hypotheses are tested on a sample of 150 Fortune 250 firms from the late 1980s. It is found that, in firms in which common equity ownership is concentrated, CEO compensation is considerably lower and less sensitive to performance. Large CEO stockholdings are associated with smaller and less risky compensation. Further, it is found that CEO holdings are larger when large blockholders exist, suggesting that blockholders exert some of their influence on CEO performance by encouraging them to hold larger blocks. While no relationship is found between CEO stockholdings and firm performance, it is found that firms with concentrated ownership are less profitable than firms in which ownership is not concentrated.

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MELICK, WILLIAM R., and CHARLES P. THOMAS, *Recovering An Asset's Implied PDF from Option Prices: An Application to Crude Oil During the Gulf Crisis.*

We develop a general method for estimating the implied, martingale equivalent, probability density function (PDF) for futures prices from American options prices. The early exercise feature of American options rules out the derivation of a closed form expression for the price of the option in terms of the PDF. Therefore, we derive tight bounds for the option price that can be written in terms of the PDF. These bounds are then used with observed option prices to estimate the parameters of the PDF. The bounds and estimation technique can be applied to any commodity or index on which there are futures contracts and associated options. This includes commodity prices, stock indexes, and exchange rates. Moreover, in markets where risk premiums are likely to be small, there will be a close correspondence between the estimated martingale equivalent PDF and the true PDF.

As an example, we estimate the market's expectations for oil prices during the Persian Gulf crisis. We find that there were periods when the market attached significant probability to prices exceeding $50 per barrel. We compare our estimates with those from a more standard Black-Scholes framework and find that ours place significantly greater mass in the right-hand tails of the distributions.

The paper is similar in spirit to the standard recovery of implied volatility from the Black-Scholes (1973) model or works such as Bates (1990) that use option prices to estimate the parameters from a more complicated stochastic process for the price of the underlying asset. Our technique will be useful in situations where interest is focussed on possible outcomes for the price of the underlying asset, rather than on the stochastic process that is generating movements in the price of the underlying asset.

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MICHAELY, RONI, RICHARD H. THALER, and KENT L. WOMACK, *Price Reactions to Dividend Initiations and Omissions: Overreaction or Drift.*

This paper investigates market reactions to initiations and omissions of dividend payments. Consistent with the prior literature, we find that three-day, market-adjusted price reactions to announcements of dividend omissions are greater than those to announcements of initiations (−7.0 percent versus +3.4 percent). Because firms usually initiate cash payments with a small payment relative to the payments that omitting firms eliminate, this short-run difference in price reactions is at least partially explained by the differences in the magnitude of the yield change between the two types of events. Following the announcements, prices continue to drift in the same direction as the initial reactions. For initiations, the price drift averages +7 percent for the first postevent year. For omissions, the first-year drift is −11 percent and the three-year loss is at least −15 percent. These price drifts are robust to several choices of a comparison benchmark. This postdividend initiation and omission price drift is also distinct from and more pronounced than that following earnings surprises. A trading rule employing both samples earns positive excess returns in 22 of 25 years. We also find little evidence for clientele shifts as measured by abnormal volume or institutional ownership in either sample.

These dividend-event reactions are interesting because they add to a growing literature that shows significant, long-run drift following important corporate events such as stock repurchases and public offerings. But they are in contrast to previous overreaction results documented by De Bondt and Thaler (1985, 1987) and Bremer and Sweeney (1991).

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MINTON, BERNADETTE A., *An Empirical Examination of U.S. Dollar Swap Spreads.*

A plain vanilla interest rate swap is a bilateral agreement in which one counterparty makes a series of fixed-rate interest payments and receives a series of payments linked to a short-term floating-rate index such as six-month London Interbank Offer Rate (LIBOR), while the other counterparty undertakes the opposite set of transactions. Under certain simplifying assumptions, the cash flows of a plain vanilla interest rate swap can be replicated by a portfolio of two noncallable par bonds of comparable maturity or by a portfolio of consecutive single payment short-term interest-rate forward contracts extending out to the last settlement date of the swap. Swap pricing, therefore, should be closely related to the pricing of these underlying instruments. This paper estimates the economic determinants of at-the-market U.S. dollar swap spreads (the basis point spread to the semiannual bond equivalent of a comparable maturity Treasury yield against receiving the variable index flat) and finds that medium- and long-term swap spreads are positively related to interest rate volatility and the corporate quality spread, and negatively related to the slope of the term structure and level of the interest rate.

Relying on the near equivalence of futures and forwards, the second part of this paper examines the pricing relation between swaps and Eurodollar futures contracts and finds that short-term over-the-counter swap rates are highly correlated with swap rates calculated using Eurodollar futures prices. However, regression results show that OTC swap rates do not move one-for-one with futures-derived swap rates. In addition, the risk profiles of short-term swaps and Eurodollar strips are found to differ. Consistent with the credit enhancements in the futures market, spreads derived from Eurodollar futures prices are not related to the corporate quality spread within the fixed-rate corporate debt market. Moreover, variation in short-term swap spreads can be explained by variation in futures-derived swaps spreads and the corporate quality spread. Overall, the results in this paper suggest that while swap pricing is closely related to corporate bond pricing and Eurodollar futures pricing, swaps are not equivalent to portfolios of bonds or futures contracts, in part due to the differences in the credit risk in each instrument.

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MUSCARELLA, CHRIS J., and MICHAEL R. VETSUYPENS, *Stock Splits: Signaling or Liquidity—The Case of ADR 'Solo-splits.'*

Stock splits are purely cosmetic transactions, yet the significant stock price increases around split announcements and split executions are well-documented. In most academic explanations offered for these puzzling transactions, splits act as a costly signal, allowing managers to credibly convey favorable inside information to investors. In contrast, practitioners usually claim that splits restore a company's stock price to a lower, optimal trading range that expands the shareholder base and improves the stock's liquidity. The evidence in support of these explanations is mixed.

This paper uses international capital markets to conduct a new test of signaling versus liquidity explanations of stock splits. We analyze the stock market reaction to splits of American depositary receipts (ADRs). ADRs are ownership certificates of foreign companies issued by a U.S. depositary bank. They trade in the U.S. on organized exchanges or over-the-counter. Typically, when the underlying foreign stock splits in its home market, the ADR also splits in the United States.

However, we document that ADRs occasionally split independently of the underlying foreign stock. Assuming that such ADR "solo-splits" are unlikely to be motivated by signalling reasons, they represent a unique setting to isolate liquidity effects from signalling explanations: any excess returns observed at the time of ADR solo-split announcements must reflect the expected benefits from greater post-split liquidity. Conversely, an absence of excess returns around such announcements would support the traditional signalling interpretation given to the positive excess returns observed around ordinary split announcements.

Our results are consistent with a liquidity explanation for stock splits. We find significantly positive abnormal returns between 1 and 2 percent around the announcement of ADR solo-splits. This evidence leads us to doubt existing signalling interpretations of market reactions to splits. If ADR solo-splits do not serve as a signaling mechanism, as we claim, then our results show that ADR solo-splits have value because of their liquidity benefits. Apparently, the market rewards foreign firms that make their stock more attractive to U.S. investors. By implication, the positive stock market reaction to ordinary stock splits documented in the literature, which has been interpreted as a signal of future cash flows, may very well be (at least partly) a manifestation of the same liquidity effects that appear to be at work with ADRs.

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NAIK, VASANTTILAK, and MOON LEE, *The Yield Curve and Bond Option Prices with Discrete Shifts in Economic Regimes.*

We develop a model of the term structure of interest rates and bond option prices that allows for random, discrete shifts in the economic regime. Regime shifts significantly alter the mean of bond yields as well as the volatility of yield changes. They may be caused, for example, by changes in fiscal and monetary policy, jumps in investors' confidence, and transitions in global political and economic relationships. Bond and bond option prices differ considerably across economic regimes, holding constant other variables such as the level of the short rate. Thus, the failure to account for shifts in interest rate regimes may result in significant under- or overpricing of interest rate sensitive cash flows. Our empirical analysis shows that regime shifts capture the fat tails observed in the distribution of changes of short-term bond yields and the observed persistence in the volatility of yield changes better than the Vasicek model and the one- and two-factor models of Cox, Ingersoll, and Ross.

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NYBORG, KJELL G., and SURESH SUNDARESAN, *Discriminatory Versus Uniform Treasury Auctions: Evidence from When-Issued Transactions.*

The U.S. Treasury market in which marketable Treasury debt is traded, is valued at 2.6 trillion U.S. dollars. The Treasury regularly schedules auctions—currently 3 month and 6 month T-bills are auctioned every week; 52 weeks T-bills are auctioned once a month. 3 year and 10 year Treasury notes are auctioned in quarterly cycles and the 30 year Treasury bond is auctioned twice a year. All these auctions are *multiple price, sealed bid discriminatory auctions*. Given the current auction cycle, there are 126 discriminatory auctions per year. Every month 2 year and 5 year Treasury notes are auctioned by the *uniform price, sealed bid auctions*, since September 1992 on an experimental basis, resulting in 24 uniform price auctions per year. The contemporaneous use of both types of auctions, coupled with the availability of transactions data from both types of auctions, provides an opportunity to test how these two auction mechanisms have performed. This is the primary focus of our paper.

We employ transactions data from the when-issued market to assess the Treasury's auction experiment. An important finding is that when-issued volume is higher under uniform auctions, suggesting a higher degree of release of dealers' private information that, in turn, should reduce pre-auction uncertainty and thus reduce the winner's curse. Consistent with this, the difference between the auction yield and the when-issued yield around the time of the auction, *the markup*, is smaller under uniform auctions than under discriminatory auctions. Additionally, under the uniform auction, when-issued volatility is decreasing on the auction day after bidding and after the release of the auction results. In contrast, volatility is increasing under the discriminatory auction format. This suggests that the uniform auction increases information production prior to the auction and lowers the short squeeze.

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PURI, MANJU, *Conflicts of Interest, Intermediation, and the Pricing of Underwritten Securities.*

In the controversy around allowing commercial banks to underwrite securities, an important consideration is the potential conflict of interest when banks combine lending and securities underwriting. Banks have an incentive to misuse the private information from their loan monitoring activities to underwrite securities they privately know to be bad, and use the proceeds from the issue to pay down loans at the bank. Unlike banks, investment houses do not lend, and consequently do not acquire private information and must expend costly resources in evaluating the firm. Investment houses thus have an incentive to underinvest in costly information production. Either situation leads to a potential conflict of interest. The paper models the intermediaries' strategies in a sequential equilibrium, taking into account their differing incentives and mitigating reputation effects. The paper finds that even when both intermediaries have similar reputations ex ante, they can still price securities differently. Sufficient conditions are also derived for the entry of investment houses into underwriting activities, when banks are permitted to underwrite securities.

The model makes the following predictions: (i) Even when the bank's conflict of interest is most severe, there are circumstances in which banks can have higher credibility than investment houses leading to higher prices for bank underwritten issues. (ii) For junior and information sensitive securities bank underwritings are likely to fetch higher prices. (iii) The larger the financial claims that the bank has in the firm prior to the issue, the less credible the bank will be as a certifier of the firm's securities and the lower the price of the security issue. (iv) Equity claims, as compared to debt claims, in the issuing firm can enhance the conflict of interest faced by the bank, resulting in a lower price for the underwritten securities. (v) Banks and investment houses can coexist in a given economy even in the presence of differential pricing.

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ROBE, MICHEL A., *Dividend Signaling Costs: Coarse versus Separating Equilibria.*

In this paper, we show that, when privately informed managers maximize their firm's market value rather than its intrinsic value, the deadweight loss from making managerial statements credible through the payment of dividends is, surprisingly, not as steep as it might seem. We demonstrate that, as the cost of fully-revealing dividends increases, managers can circumscribe these costs by following a coarse payout policy in which net dividends signal some managerial information, but do not vary continuously with the level of corporate earnings.

The coarse dividend policy identified in the paper is appealing for two main reasons. First, the amounts paid out to shareholders do not vary one-to-one with the underlying earnings. Furthermore, managers are reluctant to cut dividends. These features of the equilibrium match widely documented evidence on corporate financial practices, in which mostly large earnings shocks prompt managers to adopt changes in dividend levels. Second, the coarse equilibrium is Pareto superior to its—more informative—separating counterpart, in that the firm's average investment level is considerably less suboptimal, and the payoff to current shareholders is higher, than in the separating equilibrium. Therefore, far from presenting cross-sectional smoothing of the impact of earnings shocks on net payout as a completely wasteful policy, the model helps explain this ubiquitous behavior instead as managers' rational response to conditions that would otherwise harm the welfare of shareholders, such as an obsession with the current share price.

In our coarse signaling equilibrium, the partial-pooling payoffs are not only strictly larger than their separating counterparts, they are also discontinuous at the pool bounds. Yet, the equilibrium payout policy is believable because no company that would like to mimic higher-quality firms by increasing payout has the means to do so. Thus, our analysis makes it clear that, when identifying signaling equilibria, it is not sufficient to consider the local incentive-compatibility constraints: in general, one must also explicitly recognize the existence of feasibility constraints. Failing to do so, and focusing solely on fully-revealing equilibria, might lead one to greatly overestimate the costs of informational asymmetries.

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SAUNDERS, ANTHONY, and BERRY WILSON, *Bank Capital Structure: An Analysis of the Charter Value Hypothesis.*

Recent profitability and recapitalization trends in the banking industry appear to be consistent with a hypothesis advanced by Keeley (1990) termed the "charter value" hypothesis. Under this hypothesis, banks with greater charter value voluntarily hold higher capital ratios to self-insure against its loss under regulatory enforced closure. Alternatively, increased branching and other forms of deposit and lending diversification may actually serve to reduce the capital required by banks to protect against adverse economic shocks, while increasing their expected survival rate and thus expected charter values. We term this alternative scenario the "diversification hypothesis."

This paper analyzes a one hundred year history of individual-bank market and accounting data. We find that recent trends in bank portfolios toward greater asset risk through increased loan and risky-investment percentages to be largely a return to a more typical pre-Depression bank portfolio composition. As well, bank charter values have been lower overall during the post-Depression period, but have shown mostly an increasing trend since the 1940s.

To test the charter value hypothesis, the full one-hundred year period is broken into five 20-year subperiods. Our results for the two most recent 20-year subperiods indicate weak positive support for the charter value hypothesis. In contrast, during roughly the pre-World War II period the results of our analysis support the diversification hypothesis. These results suggest that restrictions on permissible bank activities, such as the Glass-Steagall Act, may have had important effects on bank charter values, bank asset diversification, and bank capital structure decisions.

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SINKEY, JOSEPH F., JR., and DAVID A. CARTER, *The Determinants of Hedging and Derivatives Activities by U.S. Commercial Banks.*

This paper examines empirically the determinants of hedging and derivatives activities of U.S. commercial banks during the early 1990s. The framework for these tests includes contemporary theories of banking and hedging behavior. Banks use derivatives contracts either for hedging or dealing or both. Less obviously, since derivatives can be used to reduce the probability of financial distress for client firms, banks also benefit by reducing the risk exposures of these customers. However, as the cases of Procter & Gamble and Gibson Greetings, Inc. have demonstrated, selling complex risk-management services to client firms may not always enhance bank-customer relationships.

Although the growth in the use of derivatives such as forwards, futures, options, and swaps by banks has been explosive, it has not been an industry-wide phenomenon. During the early 1990s, only 600 or so commercial banks (of some 11,000) used derivatives, with six large dealer banks accounting for 70 percent of this usage. Further, 13 banks accounted for 82 percent of the derivatives activities. Using both descriptive tests and regression models, the empirical analysis focuses on the differences between user and nonuser banks. Controlling for dealer activities, the investigation also analyzes the use of derivatives for hedging.

The descriptive findings suggest that user banks, including large dealer banks, have weaker capital positions, smaller maturity gaps, lower net interest margins, and use more notes and debentures to fund assets; but, overwhelmingly, they are simply much larger than nonuser banks. In subsamples of midsized and smaller banks, viewed primarily as hedgers, users have smaller maturity gaps, among other differences, and are larger than nonuser banks. For the smaller banks, size may capture a managerial willingness to hedge with interest rate contracts. Tobit regression results, which are statistically significant, tend to confirm the descriptive results.

Since the barriers to entry and economies of scale or scope in derivatives activities seem to be so great, correspondent banking would seem to offer a convenient and efficient way for the numerous nonuser banks to obtain such services, not only for themselves, but also for their customers. The threat of derivatives liability should caution dealer banks to make sure that their clients understand the contracts they enter. On balance, both banking and nonbanking firms need policies, procedures, and controls regarding derivatives activities, especially speculative contracts.

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STEELEY, JAMES M., *The Nature and Implications of Serial Diversification.*

Contemporaneously, the variance of the returns of an equally-weighted portfolio of securities approaches the average covariance of the return of the component securities, as the number of securities in that portfolio increases. This is the fundamental principle of diversification, due to Markowitz (1952). By interposing a time displacement in the calculation, it is possible to show that the autocovariance of the returns of a portfolio of securities will approach the average cross autocovariance among the returns of the component securities of the component securities. Rather than the usual downward sloping hyperbolic functions observed in the contemporaneous case, observed serial diversification functions are upward sloping hyperbolic functions of the number of securities in the portfolio. Moreover, the functions are found to be decreasing functions of firm size and decreasing functions of the temporal displacement (lag length). It is found that between 15 and 30 stocks are necessary for the cross autocovariances of the component security returns to dominate the influence of the security autocovariances in determining the portfolio return autocovariance. The serial diversification principle is extended further to generate a measure of cross serial diversification. Here, the cross autocovariance between the returns of a leading portfolio and those of a lagging portfolio tends towards the average cross autocovariance between the returns of the component securities across both portfolios. The observed cross serial diversification functions are 3-dimensional surfaces, with hyperbolic cross sections, which tend to flatten out once around 10 securities have been added to each portfolio.

The framework of serial diversification provides a number of additional insights into the structure of short-horizon portfolio return autocorrelations and cross autocorrelations. It is shown that autocorrelation functions can be decomposed into a ratio of diversification processes. This permits the identification of the key internal influence on portfolio return autocorrelations. Empirically, differences in portfolio return autocorrelations and cross autocorrelations are seen to be generated by differences among the average cross autocovariances of the component security returns. This offers research into the external causes of portfolio return autocorrelations a further line of enquiry.

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STICKEL, SCOTT E., *The Influence of Brokerage House Buy and Sell Recommendations on Stock Prices.*

Buy recommendations issued by brokerage houses are associated with an average 1.14 percent price increase over the 11 business days centered on the date of the brokerage house report. Sell recommendations are associated with an average −1.23 percent price decline. But these averages are misleading because they include the confounding effects of earnings forecast revisions and earnings announcements, as well as less-informative, month-end-dated recommendations.

Averages also obscure the factors that influence price reaction. The analysis here finds that: (1) downgrades to strong sell and sell have greater negative impact than downgrades to hold and, to a lesser extent, upgrades to strong buy have a greater positive impact than upgrades to buy, which suggests that analysts are able to detect the extent to which a stock is overvalued or undervalued; (2) changes in recommendation that skip a rank (e.g., 3 to 1) have a larger price effect than changes in recommendation that do not skip a rank, but these differences appear to be temporary; (3) analysts on the *Institutional Investor* magazine first-team All-American list have the greatest influence on prices, which suggests that analyst reputation is important, but the influence of All-Americans appears to be a temporary, price pressure effect; (4) larger brokerage houses have more impact on prices, which is consistent with larger houses having stronger marketing staffs; however, this also appears to be a temporary effect; and (5) smaller companies have larger reactions to recommendations, which is consistent with there being fewer alternative information sources about the value of smaller companies; this firm size effect appears to be a permanent, information effect.

The immediate impact of these factors is illustrated by noting that the average return to buy recommendations triples, going from 1.14 to 3.37 percent over days -5 to $+5$, if it is a strong buy, that skips a rank, issued by a first-team All-American employed by a larger brokerage house (top quintile) recommending a smaller company (bottom quintile). Sell and strong sell recommendations with otherwise similar characteristics are associated with an average -3.67 percent decrease over days -5 to $+5$. These averages exclude the confounding effects of contemporaneous forecast revisions and earnings announcements, and exclude less informative, periodic (month-end dated) recommendations.

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WANG, JIANG, *The Term Structure of Interest Rates In A Pure Exchange Economy With Heterogeneous Investors.*

Existing equilibrium models of the term structure of interest rates often assume identical investors. These models focus on the behavior of bond prices and ignore the interaction among (heterogeneous) investors in the market and its effect on bond prices. This paper presents a simple model of the term structure of interest rates when investors have different preferences and trade in a competitive securities market. The basic model considers a pure exchange economy that has a complete securities market and consists of two investors with different (but constant) relative risk-aversion. The model gives closed-form solutions to bond prices, and is used to analyze how investor heterogeneity affects the term structure of interest rates.

It is shown that the interaction between the two classes of investors can generate different patterns of the yield curve. As the level of aggregate consumption changes over time, the yield curve also changes its shape. In particular, the borrowing and lending among the investors tends to increase the volatility of short term yields. On the other hand, the preferences of the more risk-averse investor dominates the long-term yields under mild growth of the economy, independent of the wealth distribution between the two investors. This implies that investors with small amount of wealth (as the percentage of aggregate wealth) can have large effects on security prices.

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WERMERS, RUSSELL R., *Herding, Trade Reversals, and Cascading by Institutional Investors.*

We analyze the equity portfolio holdings of 274 mutual funds over the 1975 to 1984 period to detect whether regularities exist in the trading patterns of these funds, and

to investigate the relation between any regularities that are present and the underlying stock returns. The regularities investigated include "herding" (simultaneous same-direction trading by a group of funds), "cascading" (sequential same-direction trading by two groups of funds—one following the other), and "trade reversals" (sequential opposite-direction trading by a single group of funds). We develop new measures of these regularities that are based on similarities in the directional movement of the portfolio-weight vectors of funds at the same time (herding), or during consecutive time periods (cascading or trade reversals). Our results provide evidence of herding behavior, especially among funds that achieved superior risk-adjusted returns during the period. We also document evidence that the funds followed potentially destabilizing trading strategies by strongly herding into stocks with high prior-quarter returns. In addition, stocks that the funds bought as a herd had significantly higher abnormal returns, during the following quarters, than did stocks that the funds sold as a herd.

In our analysis of intertemporal trading patterns, we show that performing funds exhibited short-term trade reversals, especially in stocks with high past returns, while the remainder of the funds did not. Finally, we find evidence of some groups of funds cascading their portfolio choices on the prior portfolio choice of other funds, in subgroups of stocks with a large number of the 274 funds involved in trading.

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WOMACK, KENT L., *Do Brokerage Analysts' Recommendations Have Investment Value.*

An analysis of new buy and sell recommendations of stocks by security analysts at fourteen major U.S. brokerage firms shows significant, systematic discrepancies between prerecommendation prices and eventual values, in contrast to the conclusions of many previous studies. The average initial price change at the time of the recommendations is large (+2.9 percent and −4.7 percent for buys and sells, respectively), even though few recommendations coincide with other public information releases or provide previously unavailable facts. These price changes are apparently attributable mainly to information processing and dissemination, consistent with the Grossman and Stiglitz (1980) definition of market efficiency, in that informed investors earn a return on information gathering and processing.

Initial price reactions are incomplete, and postrecommendation risk-adjusted price drift implies that analysts' recommendations provide tradable value for investors. For buy recommendations, the mean postevent drift is modest (+2.4 percent) and short-lived (one month), but for sell recommendations, the drift is larger (−9.1 percent) and extends for a longer period (six months). Analysts appear to have overall market timing as well as individual stock picking abilities. Accurate industry predictions are an important component in negative ("sell" and "removed from buy") recommendations.

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