Economic Consequences of Off-Balance Sheet Financing:

The Case of Equity Method Investments

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ABSTRACT

This paper empirically analyzes the determinants and consequences of one particular type of off-balance sheet arrangement-equity method investments. I develop testable hypotheses based on information asymmetry and agency theory to examine whether off-balance sheet financing leads to economic efficiency. Consistent with theoretical predictions, the empirical results show that firms with higher agency costs of debt, more severe adverse selection problems and higher risk-shifting incentives are more likely to undertake equity method investments as a source of external financing. I also find that equity method investments result in improvement in subsequent operating performance and firm value. Further, I provide evidence that, while on average investors correctly assess the off-balance sheet risks associated with equity method investments, they appear to underestimate the risk exposure of companies who guarantee the off-balance sheet entity's debt. Overall, the empirical results of this paper support the hypothesis that firms are motivated to set up off-balance sheet arrangements for economic efficiency reasons.

1. Introduction

Off-balance sheet financing has become a popular corporate finance tool over the past three decades. Off-balance sheet (OBS) arrangements enable companies to obtain financing without showing debt on their balance sheets. These arrangements often involve a transfer of assets to independent entities that perform a specific activity for the company and whose financial statements are not consolidated with those of the company. The proliferation of OBS financing arrangements and their "hidden" nature, as highlighted by the Enron scandal, has led to increased regulatory scrutiny. Since 2001, a number of new rules have been issued to regulate the accounting for vehicles used by companies to keep liabilities off their balance sheets. These regulations were introduced with the aim of improving financial reporting transparency and protecting investors from being misled by companies. While this view attributes managers with opportunistic motives, in fact these OBS arrangements may be motivated by sound economic reasons. The purpose of this paper is to examine whether off-balance sheet financing leads to economic efficiency. I examine three key issues: the determinants of the decision to undertake off-balance sheet financing arrangements, their effect on operating performance and firm value, and whether investors understand the risk of companies with off-balance sheet arrangements.

Corporate managers often argue that OBS arrangements are created to finance new ventures without diluting the interests of existing shareholders and without adding to the parent company's debt burden. For example, the 2004 10-K filing of General Electric states that "we use off-balance sheet arrangements in the ordinary course of business to

improve shareholder return." This view is also supported by some theoretical work in this area that shows that companies can use OBS financing to achieve an optimal investment level by reducing adverse selection and the agency cost of debt (John and John, 1991, Kahn and Winton, 2004, and Shah and Thakor, 1987). In contrast, recent empirical findings appear to support the regulators' viewpoint regarding managerial opportunism as a motivation for OBS financing (for example, Mills and Newsbury, 2005). To shed light on this important debate, this paper focuses on whether OBS financing can lead to an improvement in firm performance.

In this paper, I examine one particular type of off-balance sheet arrangement: equity method investing in unconsolidated entities. The equity method of accounting is applicable when the investor company can exercise significant influence over the operating and financial policies of an investee, typically when the investor has an ownership interest between 20% and 50%. The equity method allows a company to report only its proportionate share of income from an unconsolidated entity on the income statement and its net investment in the entity on the balance sheet, enabling the investor company to avoid balance sheet recognition of assets and liabilities of the unconsolidated entity. Thus, investments in entities reported under the equity method represent OBS financing arrangements.

I identify a sample of non-financial firms that initiate equity method investments during the period 1991-2000. I restrict the sample to significant users of these financing arrangements by requiring firms to have equity method investments in excess of 10% of total assets and/or equity income in excess of 10% of income before extraordinary items.

I first examine the determinants of a company's decision to initiate substantial equity method investments. For the purpose of this test, I construct a control sample of firms that do not use equity method investments in the current and the preceding year, matched by industry. My results show that firms with higher agency costs of debt and more severe adverse selection problems are more likely to initiate substantial equity method investments. I then analyze whether equity method investments lead to economic gains for the users. Since companies do not undertake equity method investments at random, I use a two-stage self-selection method and an instrumental variable method to address the endogeneity issue. The results indicate that equity method investments are related to increase in firm value as measured by Tobin's q. In addition to finding that firms have economic incentives for undertaking equity method investments, I also conduct an ex post examination of subsequent efficiency gains. I find that the sample firms with equity method investments exhibit an improvement in subsequent operating performance relative to the control firms.

The paper then examines whether investors understand the off-balance sheet risk associated with equity method investments. If investors underestimate the risk, it is likely that the company's stock is overvalued. If this is true, we would expect negative abnormal returns in subsequent periods. My results show that abnormal returns in the subsequent period are insignificant after controlling for commonly used risk factors, suggesting that, on average, investors correctly assess the risk associated with equity method investments.

The above results indicate that accounting disclosures in relation to equity method investments are in general adequate for assessing the off-balance sheet risk. However, a recent FASB interpretation (FIN 45, 2002) changes the reporting of guarantee obligations from footnote disclosure to actual recognition of fair values, suggesting that the existing disclosure requirements in relation to guarantees lacked transparency. In view of the reporting inadequacy implied by this interpretation, I test whether investors can correctly assess the off-balance sheet risk when equity method investors have guaranteed the investee company's debt. Consistent with the regulators' concern, I find that the investors of equity method users who are guarantors of the investee's debt earn significantly negative abnormal returns ("alphas") in subsequent periods in contrast with insignificant "alphas" earned by other users. Assuming that the expected payoffs are correctly priced, this result suggests that investors may be underestimating the risk of equity method users who provide guarantees to their investees. Thus, it appears that off-balance sheet financing accompanied by guarantees imposes additional risk on the investor company and that this risk may not have been fully communicated to investors under the previous rules.

Overall, the results in this paper favor the economic efficiency hypothesis, since I find that firms with higher agency costs of debt and more adverse selection problems are more likely to undertake equity method investments. I also find that, on average, companies with off-balance sheet arrangements in the form of equity method investments exhibit an improvement in subsequent operating performance and firm value. Finally,

my results show that, on average, investors do understand off-balance sheet risk, except in the case of companies who have guaranteed the investee company's debt.

This paper adds to a growing body of literature that examines the incentives for using off-balance sheet arrangements and accounting choice in general. Researchers in general examine the motivation behind an accounting choice by testing the relationship between company characteristics used as incentive proxies and the decision choice. Prior studies on off-balance sheet arrangements use a similar methodology and interpret their findings as evidence that companies use these arrangements to manage the balance sheet. While my paper does not rule out balance sheet management as a motivation for off balance-sheet financing, it highlights an alternative motivation, namely economic efficiency, by investigating the effects of these arrangements on operating performance and firm value. Nevertheless, my results show that investors appear to be misled when a large portion of the off-balance sheet risk is retained with the company via guarantee obligations.

The paper proceeds as follows. In section 2, I review the literature and develop the hypotheses. In section 3, I describe the data, sample selection and research design. Section 4 presents the findings of the determinants of off-balance sheet arrangements in the equity method investment setting, the effects on operating performance and firm value, and whether investors understand the off-balance sheet risk. Section 6 includes concluding remarks.

2. Literature Review and Hypothesis Development

In this section, I first review some theoretical work and empirical findings related to off-balance sheet financing. I then present testable hypotheses that I examine in the paper.

2.1 Theoretical considerations

2.1.1 Adverse selection and agency costs of debt

In a frictionless capital market envisioned by Modigliani and Miller (1958), a company's investment decision is not affected by financial factors. However, frictions cause investment distortion. Adverse selection and agency costs of debt are examples of such frictions.

There is a long stream of papers on the adverse selection problem due to ex ante information asymmetries between managers and investors. With imperfect information about the risk of borrowers' investment projects, investment is distorted from the first-best level. Shah and Thakor (1987) present a signaling model to explain the rationality of project financing. They show that, if a firm's objective is to maximize shareholders' value, it is advantageous to set up project financing instead of letting the sponsor firm play a revelation game for riskier projects. They argue that, when a project is financed through off-balance sheet financing, the lenders of the project can be actively involved in the project and produce information about the new project. As a result, a company with a good investment project does not need to pay an information premium in order to differentiate itself from "lemons". The implication of this theory is that off-balance sheet

financing can help companies achieve efficiency gains by mitigating the adverse selection problem.

There is also abundant literature about the agency cost of debt due to the conflicts between different claimholders. Jensen and Meckling (1976) illustrate the risk-shifting (also called "asset substitution") problem where managers, acting on behalf of equity holders, have incentives to invest in risky projects since the equity holders' claim on a levered company is increasing in volatility. Such investments may result in a decrease in the value of the debt. However, the debt holders can rationally anticipate the equity holders' risk-shifting behavior. Thus, the cost of the incentive to invest in value-decreasing risky projects is ultimately borne by equity holders. This is the agency cost of asset substitution. Kahn and Winton (2004) argue that financial institutions use separate subsidiaries to insulate safer loans from riskier loans to reduce the risk-shifting problem.

Another form of the agency cost of debt is the underinvestment problem illustrated in Myers (1977). He argues that debt investors who fund new investments do not like managers to invest in risky projects because the value generated by the new investments goes to existing debt holders and is not available to the new debt holders. Therefore, managers have to pass up some risky projects even if these projects have positive net present value. This is the agency cost of underinvestment. How off-balance sheet financing solves the underinvestment problem is laid out in John and John (1991). They show that a company can optimally allocate its debt between the parent company and the off-balance sheet financed venture, which can result in increased firm value.

2.1.2 Risk management and other economic motivations

A strong incentive for undertaking equity method investments is managing risk by sharing it with partners. In a survey by Rawls and Smithson (1990), corporate finance executives rank risk management as an important objective. Potential rationale for risk management includes managerial risk aversion, tax minimization, increased debt capacity to avoid financial distress (Smith and Stulz 1985), and reduction of investment distortions (Froot, Scharfstein and Stein 1989, 1993).

It is well-documented in the economic and strategic literature that joint ventures (one type of equity method investment) can achieve economies of scale, overcome entry barriers into new markets, pool complementary bits of knowledge, and gain access to foreign markets (see Harrigan 1988, Berg and Friedman 1980). Hennart (1988) builds on Williamson's (1975) transaction cost theory and argues that when market failure occurs due to the difficulty of transferring tacit knowledge, distribution channels, country specific knowledge, and access to capital markets, joint ventures become valuable tools to gain these valuable assets.

The above theoretical findings help to identify the factors and incentives that may govern a company's decision to undertake equity method investments. My empirical analysis develops proxies for these factors and incentives and tests whether they are significantly related to the decision to undertake these investments.

2.2 Prior Empirical Evidence

Companies use many types of arrangements with off-balance sheet implications,

for example, equity method investments, transfers of financial assets (e.g. accounts receivables) with continuing involvement, operating leases and synthetic leases, post-retirement arrangements, contingent obligations and guarantees, derivatives and other contractual obligations. Since the debt associated with these arrangements is off the accounting books (except some disclosure in the footnotes or in the management discussion and analysis section), finding a comprehensive set of companies with off-balance sheet arrangements is difficult. As a result, the literature has separately examined several different types of off-balance sheet arrangements, including R&D limited partnerships, and sales of asset-backed securities (e.g. securitization).

Several empirical studies find that a firm's decision to undertake off-balance sheet financing is associated with managerial incentives. These studies examine alternative forms of off-balance sheet arrangements. Shevlin (1987) finds that the decision to establish an off-balance sheet R&D limited partnership is associated with lower marginal taxes, higher as-if leverage and lower interest coverage ratios, and the existence of management bonus plans. He interprets these results as evidence in support of tax shelter, and debt renegotiation hypotheses. Mills and Newberry (2005) construct a proxy for off-balance sheet financing measured by the difference in tax and book interest expenses and find that off-balance sheet financing is greater in companies with higher leverage and weaker debt ratings. Their interpretation is that companies use off-balance sheet arrangements to manage debt ratings. Karaoglu (2002) shows that regulatory capital and earnings outcomes influence manager's discretion in asset securitization. Dechow,

Myers, and Shakespeare (2005) find that the asset securitization originators manage earnings through managing the value of the retained interest.

In contrast, some empirical studies find evidence inconsistent with managerial opportunism as a motivation for certain types of off-balance sheet financing. Lim, Mann and Mihov (2003) find that off-balance sheet operating lease debt is comparable with balance sheet debt and bondholders are not misled by off-balance sheet debt. Beatty, Berger, and Magliolo (1995) study the determinants of setting up off-balance sheet R&D organizations. They find that the decision to establish an R&D organization is related to the cost of debt renegotiation and information costs between the sponsor company and the investors of the R&D organization. Additionally, they do not find evidence that companies subsequently earned higher returns or issued seasoned equity. They interpret this result as evidence inconsistent with managers attempting to mislead equity investors.

Thus, the existing empirical literature reveals mixed evidence in relation to the managerial opportunism hypothesis and some evidence in support of the economic efficiency hypothesis. At the same time, theoretical research predicts that economic gains can be obtained through off-balance sheet financing due to a reduction in adverse selection and agency costs of debt, and the management of risk.

This paper hypothesizes that companies are motivated to set up off-balance sheet arrangements (in the form of equity method investments) for the purpose of economic efficiency. In broad terms, I test the following hypotheses:

H1: *The likelihood of undertaking equity method investments is increasing with adverse selection, agency costs of debt, and risk-shifting incentives.*

H2: *Equity method investments lead to improvement in operating performance and increase in firm value.*

H3: *Investors correctly price off-balance sheet risks associated with equity method investments.*

3. Data and Research Design

3.1 Data and Sample

I use the 2004 COMPUSTAT Industrial tape to select a sample of non-financial US companies that have equity method investments during a period of 10 years from 1991 to 2000. There are two reasons to restrict the sample period to after 1991. First, prior to SFAS 94 (effective fiscal years ending after 1988), companies were not required to consolidate inter-corporate investments in non-homogeneous subsidiaries (e.g. financing or leasing subsidiaries). SFAS 94 changed this practice so that investments in non-homogeneous entities can be kept off the balance sheet only if they represent an ownership interest below 50%. Second, SFAS 105 changed the disclosure regime effective fiscal years ending June 15, 1990 by requiring companies to disclose information about financial instruments with off-balance sheet risks or with a concentration of credit risks in the notes to financial statements.

In this study, three COMPUSTAT data items are used to determine if a company has equity method investments in unconsolidated entities -- investment-equity method (data31), equity in earnings (data55), and equity in net earnings/losses (data106).[1] My

[1]Data31 represents investment in unconsolidated entities over which the parent company has significant influence. Data55 represents the parent company's share of earnings/loss from unconsolidated entities.

sample of new users includes companies that initiate *substantial* equity method investments in a given year. I define equity method investments as *substantial* if the company (i) invests at least 10% of its total assets in equity method investees, and/or (ii) earns at least 10% of its income before extraordinary items from equity earnings in a given year, and (iii) has non-substantial equity method investments in the prior year.[2] In investigating the determinants of undertaking equity method investments and its effect on firm value, I use the following criteria to construct a control sample of equity method non-users: (a) I identify companies that do not use equity method investments in the current as well as the prior year, and (b) for each new user, I randomly select one equity method non-user firm from the same year and the same industry (Fama and French 30-industry classification) as the new user. My final sample includes 209 new users and the same number of equity method non-users.

3.2 Research Design

3.2.1 Determinants of off-balance-sheet financing

To determine whether off-balance sheet arrangements through equity method investments are undertaken for reasons of economic efficiency, I use the probit model to test whether the likelihood of initiating equity method investments is increasing with

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Data106 is the amount appearing in the cash flow statement and represents the parent's share of unconsolidated entities' earnings included in the income statement less any dividends received from these entities.

[2]I define non-substantial equity method investments as investments less than 2% of total assets and/or earnings less than 2% of income before extraordinary items. Although the sample size reduces, the results remain substantially unchanged when I require the firms to have no equity method investments in the prior year.

adverse selection and agency costs of debt, and risk-shifting incentives. The probit model is specified as follows:

$$W_{it} = \beta_0 + \beta_1 RATING_{it-1} + \beta_2 INSTU_{it-1} + \beta_3 RETVOL_{it-1} + \beta_4 LEV_{it-1} * M/B_{it-1} + \beta_5 LEV_{it-1} + \beta_6 M/B_{it-1} + \beta_7 ASSET_{it-1} + \beta_8 R\&D_{it-1} + \beta_9 FOREIGN_{it-1} + \beta_{10} SALESGR_{it-1} + \varepsilon_{it} \quad (1)$$

where the dependent variable, W_{it}, equals one if a company undertakes equity method investments for the first time in year *t* and zero otherwise. Since I examine the factors that affect a company's choice to initiate equity method investments in year *t*, all explanatory variables are measured at the end of year *t-1*.

Shah and Thakor (1987) suggest that companies can use off-balance sheet arrangements to solve the adverse selection problem. Asymmetric information between the company and the lender can cause a company with good investment projects to pay an information premium in order to differentiate itself from "lemons". I use two explanatory variables to proxy for the existence of an adverse selection problem, *RATING* and *INSTU*. The binary variable *RATING* equals one if a company's debt is rated by Standard & Poor's, and zero otherwise. All else equal, companies with rated debt are assumed to face less adverse selection than companies with non-rated debt. Moreover, companies receive bond ratings only if they issue public debt, so that companies with debt rating are likely to have access to the public debt market. Hence, companies with a debt rating are hypothesized to be less likely to use equity method investments. *INSTU* measures percentage of shares owned by institutional shareholders. If a company has lower institutional ownership, there is likely to be more information asymmetry between outside investors and the company. Therefore, I predict that there is

a negative relationship between institutional ownership and the use of equity method investments. Data on percentage of shares owned by institutional holders is collected from CDA/Spectrum Institutional (13f) database which contains the filings made under section 13f to the Securities and Exchange Commission.

Jensen and Meckling (1976) illustrate the risk-shifting problem where managers of a levered company are more inclined to undertake risky projects to enhance equity value by increasing volatility. Kahn and Winton (2004) suggest that companies can reduce their risk-shifting problem by separating subsidiaries' debt from that of the parent. To proxy for the risk-shifting incentive, I use *RETVOL* measured as the standard deviation of stock returns. I predict that companies with higher *RETVOL* are more likely to use equity method investments. Using the standard deviation of stock returns as a proxy for the risk-shifting incentive is consistent with Green (1984). Green (1984) suggests that idiosyncratic risk rather than systematic risk motivates the incentive to take on risky projects and hence the measure of total risk is a good proxy to use for the risk-shifting incentive.

John and John (1991) argue that debt investors who fund a new investment do not like managers to invest in risky projects because they may not be compensated if the value generated by the new investment goes to existing debt holders and is not available to the debt investors of the new projects. As a result, managers may pass up some risky projects even if these projects have positive net present value. Based on this reasoning, I predict that companies that face a higher underinvestment problem are more likely to use equity method investments. Following Geczy, Minton, and Schrand (1997), I construct a

proxy for the underinvestment problem that captures the interaction of the opportunity to invest (captured by the market-to-book ratio) with the lack of ability to finance investment (captured by leverage), measured by (*LEV*M/B*), where *LEV* is defined as the sum of the book value of long-term debt and short-term portion of long-term debt (data9+data34) divided total shareholders' equity (data216), and *M/B* is defined as the market value of equity divided by the book value of equity.

I include several controls for other firm characteristics that could impact the use of equity method investments. Previous studies find that companies with higher leverage are more likely to use off-balance sheet arrangements. Therefore, I include *LEV* as an explanatory variable. Since *LEV* may not be the best measure of financial constraint, in the robustness check, I include a variable *KZ* (Kaplan and Zingales financial constraint index).[3] A higher value of the KZ index indicates that the company is more financially constrained.

To control for growth, I use *SALESGR*, the average sales growth in the previous five years (with a minimum three year requirement). Research and development expenditure (data46) scaled by sales, *R&D,* is used to control for R&D intensity. Since not all companies report research and development expense, I follow Loughran and Ritter (1997) to set all missing values for R&D as zero. Based on prior research from the economic and strategic literature, evidence suggests that companies enter into joint

[3] I construct the KZ index as 1.002*Cash flow-39.368*Dividend-1.315*Cash+3.139*LEV, following Baker, Stein and Wurgler (2003), where Cash flow is defined as earnings before extraordinary items plus depreciation and amortization (data 18+data14) divided by the beginning total assets; Dividend is defined as dividends to common plus dividends to preferred (data 21+data19) divided by the beginning total assets; Cash is defined as cash and its equivalents (data1) divided by the beginning total assets; and LEV is defined as the sum of long-term debt plus the short-term portion of long-term debt divided by sum of long-term debt plus the short-term portion of long-term debt plus total shareholders' equity.

ventures to achieve economies of scale, and to gain access to foreign markets. To control for these factors, I use *ASSET* (log of total assets) and *FOREIGN* (an indicator variable that equals one if a company reports a foreign segment(s) in its annual report) as additional explanatory variables. Data on foreign segment(s) is collected from the COMPUSTAT segment database.

3.2.2 Effect of equity method investments on firm value

My second test is related to the effects of off-balance sheet arrangements in the equity method investments setting. If equity method investments are more likely to be motivated to mitigate agency costs of debt or adverse selection problem as suggested by some theoretical work, it is expected to enhance firm value.

To test whether undertaking equity method investments can enhance value, I estimate the following equation:

$$Q_{it} = \delta_0 + \delta_x X_{it} + \delta_w W_{it} + \mu_{it} \qquad (2)$$

where Q_{it} is firm value measured by Tobin's q. Following Baker et al. (2003), I construct Tobin's q as the market value of equity (price*shares outstanding) plus the book value of assets minus the book value of equity (data60+data74) divided by the book value of assets. W_{it} is a dummy variable that takes the value of one if the company has equity method investments, and zero otherwise. The estimate of δ_w is the measure of the effect of undertaking equity method investments on firm value.

X_{it} is a set of firm characteristics that are commonly used as explanatory variables for firm value, including log value of total assets (*ASSET*), leverage (*LEV*), capital expenditure (*CAPX*) defined as capital expenditure (data128) scaled by beginning total assets, and profitability (*EBITDA*), measured as operating income before depreciation and amortization (data13) scaled by beginning total assets. I also use R&D intensity as a proxy for a company's intangible assets relating to technology know-how, which is expected to have a positive effect on firm value (see Morck and Yeung, 1991). I also control for industry and year fixed effects in equation (2). In a sensitivity analysis, I include lagged values of firm characteristics. The results remain substantially unchanged.

In equation (2), the coefficient of interest is δ_w, which measures the effect of the decision to undertake equity method investments on Tobin's q. If W_{it} is an endogenous variable, the estimated coefficient on W_{it} will be inconsistent. The endogeneity can arise if W_{it} is correlated with μ_{it}. Theoretical arguments suggest that firms may use off-balance sheet arrangements to mitigate adverse selection, risk-shifting and underinvestment problems. Therefore, the equity method investments decision is an endogenous outcome that maximizes firm value. Failure to control for firm characteristics that lead firms to undertake equity method investments may result in inconsistent estimates of the effect of undertaking equity method investments on firm value. Therefore, the ordinary least square (OLS) regression will not produce a consistent estimator of δ_w. To address this problem, I use the following two methods: the two-stage self-selection method and the two-step instrumental variable (IV) method.[4]

[4]Examples of using two-stage self selection in the literature include Campa and Kedia (2002) who study the effect of diversification on firm value and Nain (2004) who studies the effect of derivative use on firm

Method 1: Two-stage self selection method

In the first stage, I use a probit model to estimate the probability of undertaking equity method investing as specified in equation (1). I rewrite equation (1) as follows:

$$W_{it} = \beta Z_{it-1} + \varepsilon_{it} \quad (1a)$$

where Z_{it-1} represents all of the firm characteristics that affect a company's decision to undertake equity method investments as specified in equation (1), including a constant term. When a company's decision to undertake equity method investments is correlated with firm value, ε_{it} and μ_{it} are correlated. Assuming these two error terms are normally distributed, the estimated firm value conditional on undertaking equity method investment is

$$E(Q_{it} \mid W_{it}=1) = \delta_0 + \delta_x X_{it} + \delta_w + E(\mu_{it} \mid W_{it}=1) = \delta_0 + \delta_x X_{it} + \delta_w + \rho\sigma_\mu \frac{\phi(\beta z_{it-1})}{\Phi(\beta z_{it-1})}$$

The estimated firm value conditional on not undertaking equity method investment is

$$E(Q_{it} \mid W_{it}=0) = \delta_0 + \delta_x X_{it} + E(\mu_{it} \mid W_{it}=0) = \delta_0 + \delta_x X_{it} + \rho\sigma_\mu \frac{-\phi(\beta z_{it-1})}{1-\Phi(\beta z_{it-1})}$$

The difference in the expected Tobin's q between equity method users and non-users is:

$$E(Q_{it} \mid W_{it}=1) - E(Q_{it} \mid W_{it}=0) = \delta_w + \rho\sigma_\mu \frac{\phi(\beta z_{it-1})}{\Phi(\beta z_{it-1})(1-\Phi(\beta z_{it-1}))}$$

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value. An example of using two-step IV method to address endogeneity of accounting choice is Cohen (2003) who examines the effect of a firm's disclosure quality decision on its cost of capital.

In the second stage, I estimate the effects of undertaking equity method investments as the coefficient (δ_w) on the dummy variable, W_{it}, from the following regression:

$$Q_{it} = \delta_0 + \delta_x X_{it} + \delta_w W_{it} + \delta_\lambda lambda_{it} + \mu_{it} \quad (3)$$

where $lambda_{it} = (W_{it}\lambda_1(\beta^* Z_{it-1})+(1-W_{it})\lambda_2(\beta^* Z_{it-1}))$, $\lambda_1 = \frac{\phi(\beta z_{it-1})}{\Phi(\beta z_{it-1})}$ and $\lambda_2 = \frac{-\phi(\beta z_{it-1})}{1-\Phi(\beta z_{it-1})}$.

$lambda_{it}$ is the self-selection parameter. The difference between equations (2) and (3) is the inclusion of the self-selection parameter in (3). With the correction for self-selection, equation (3) gives us a consistent estimate of the effect of undertaking equity method investments on firm value.

Method 2: Instrumental variable (IV) method

This method is suggested by Wooldridge (2002). In the first step, I estimate the binary model P(W=1|X, Z) using a probit regression and obtain the fitted probability $\hat{G}$. In the second step, I estimate equation (2) by IV using instruments $1, \hat{G}$, and X.

There are several appealing features about this approach. First, this approach holds without assuming normal distributions for the error terms and is therefore less restrictive than the two-stage self selection procedure. Second, since the fitted probability, instead of *Z*, is used as the instrument, there is no identification problem. Third, even if P(W=1|X, Z) is not correctly specified, the IV estimator from the second step is still asymptotically efficient. (see Wooldridge 2002, p.623).

3.2.3 The effect of equity method investments on operating performance

Theoretical arguments suggest that off-balance sheet arrangements could result in economic gains through mitigating adverse selection, risk-shifting and underinvestment problems. Further economic gains could be obtained from risk management, economies of scale, overcoming entry barriers and gaining access to foreign markets through equity method investments. For these reasons, I expect that a firm will experience improvement in operating performance after it undertakes equity method investments.

To examine effects of equity method investments on operating performance, I focus on changes in three operating performance measures, return on assets, operating income, free cash flows. Return on assets is defined as income before extraordinary items (data18) divided by beginning total assets. Operating income is defined as operating income before depreciation and amortization (data13) scaled by beginning total assets. Free cash flow is defined as operating income before depreciation and amortization minus capital expenditure (data13-data128) scaled by beginning total assets.

I assess changes in the operating performance measures using two different benchmarks. I examine both unadjusted and adjusted operating performance and track these measures over the subsequent one, two, and three years. The adjusted operating performance is defined as the difference between the operating performance of the new user and the operating performance of its control firm. I use the following criteria to construct a control sample: (i) I identify companies that do not use equity method investments in the current as well as the prior year, (ii) for each new user, non-user firms from the same industry (Fama and French 30-industry classification) and same year are

identified as candidate non-users, and (iii) the candidate non-user with the closest match in market value is selected as the control firm.

As a robustness check, I also conduct multivariate cross sectional regression of the effect of undertaking equity method investments on changes in operating performance. The specific regression used is

$$\Delta OP_{t,\,t+3} = \zeta_0 + \zeta_1 W_t + \zeta_2 \Delta OP_{t-3,\,t} + \zeta_3 M/B_t + \zeta_4 ASSET_t + \zeta_5 Year + \zeta_6 Industry + \eta_t \qquad (4)$$

where subscript i is omitted. W_t is a dummy variable that takes the value of one if the company has equity method investments, and zero otherwise. $\Delta OP_{t,t+3}$ is the cumulative change in operating performance over the subsequent three years, from t to $t+3$. $\Delta OP_{t-3,\,t}$ is the cumulative change in operating performance for the preceding three years, from $t-3$ to t. This variable is used to control for the effect of past changes in performance on subsequent changes in performance. Prior literature has shown that changes in operating performance are negatively autocorrelated, hence, the expected coefficient on $\Delta OP_{t-3,\,t}$ is expected to be negative. M/B_t is market-to-book ratio. It is used to control for growth opportunities. $ASSET_t$ is the log of total assets. Year and industry dummies are included to control for economy-wide and industry effects.

4. Empirical Results

4.1 Descriptive statistics

Table I reports the industry distribution of sample firms based on Fama and French 30-industry classification. New users of equity method investments represent a number of industries, with a higher concentration in the healthcare and service industries.

Table II tabulates the summary characteristics of equity method new users compared to their industry-year matched controls. Company characteristics are measured at the beginning of the year in which the new user initiates equity method investments. Firm characteristics of new users are generally different from those of their controls. Equity method new users are significantly larger than equity method non-users in terms of total assets and market capitalization. Equity method new users have about $2.4 billion in total assets and $1.7 billion in market capitalization on average. Equity method new users are more levered than non-users. The mean and median leverage ratio of equity method new users are 0.367 and 0.416, respectively, while the mean and median leverage ratio of non-users are 0.325 and 0.345, respectively. The average market-to-book ratio, sales growth, and R&D spending are higher for new users relative to their controls. Further, the stock return volatility of equity method new users is higher than that of their controls. In terms of percentage of institutional holding and debt rating, proxies for the severity of adverse selection problem, univariate analysis shows that there is no significant difference between equity method new users and their controls.

Table III presents the correlations among the firm characteristics that are related to the decision to undertake equity method investments. The correlations are high among most firm characteristics. For example, leverage decreases with market-to-book (*M/B*), research and development intensity (*R&D*), and volatility (*RETVOL*) and increases with total assets (*ASSET*). These results are consistent with the prior literature on capital structure. The statistically significant correlations reported in Table III highlight the

importance of using a multivariate analysis to examine the determinants of the decision to undertake equity method investments.

4.2 Determinants of undertaking equity method investments

In this section, I examine the determinants of the decision to undertake OBS financing in the form of equity method investments. The results of the probit regression are reported in Table IV. The dependent variable takes the value of one if the company undertakes *substantial* equity method investments, and zero otherwise.

As Table IV reports, the adverse selection problem provides incentives for undertaking equity method investments. The estimated coefficients on debt rating, *RATING,* and institutional ownership, *INSTU,* are negative and significant, suggesting that the incentives for undertaking equity method investments are higher when a company faces more severe adverse selection problem. This is consistent with Shah and Thakor (1987) who show that off-balance sheet financing is a way to achieve efficiency gains by reducing the adverse selection problem.

The probit regression results also support the implications of the findings of Kahn and Winton (2004). The estimated efficient on risk, *RETVOL,* is positive and significant, indicating that a company is more likely to undertake equity method investments when risk-shifting incentive is higher.

Although the estimated coefficients on growth proxies, market-to-book (*M/B*) and average sales growth (*SALESGR*) are not significantly different from zero, the coefficients on the underinvestment costs (*LEV*M/B*) are positive and statistically

significant. These results, taken together, suggest that growth opportunities alone do not motivate a firm to undertake equity method investments, but the costs of underinvestment provide incentives to do so. This is consistent with John and John (1991) who show that off-balance sheet arrangements can mitigate agency costs of underinvestment.

While the estimated coefficient on *LEV* is not significant, the coefficient on financial constraint index *KZ* is positive and significant. Thus, a higher level of financial constraint provides stronger incentive to undertake equity method investments. As expected, the estimated coefficients on *ASSET* and *FOREIGN* are positive, suggesting that companies with larger economies of scale are more likely to use equity method investments. The coefficient on research and development intensity, *R&D,* is positive and significant, indicating that R&D intensive firms are more likely to use equity method investments to fund research and development projects.

Overall, the results indicate that firms are more likely to undertake equity method investments when they have more severe adverse selection problem, higher agency costs of debt and higher risk-shifting incentives.

4.3 Effects on firm value

In this section, I report the results of analyses that test whether equity method investments can help companies to improve firm value. To control for the endogeneity of the equity method investments decision as discussed in section 3.2.2, I use the two-stage self selection method and the two-step IV method. The effects of equity method investments on firm value are reported in Table V. The OLS regression results are

reported in columns I and IV. The results of two-stage self selection are reported in columns II and V. The results of the two-step instrumental variable method are reported in columns III and VI.

The OLS regression shows a negative and statistically insignificant coefficient on the equity method investment decision, suggesting that equity method investments do not improve firm value of the current as well as the subsequent year. However, after controlling for the endogeneity of the equity method investment decision, both the two-stage procedure and the instrumental variable method show a positive coefficient on the equity method investment decision, suggesting that equity method investments enhance firm value. This is consistent with the theoretical arguments of John and John (1991), Shah and Thakor (1987), and Kahn and Winton (2004).

The coefficient on *lambda* is negative and significant, rejecting the OLS model, indicating that there is a self-selection problem and that companies with higher probability to undertake equity method investments tend to be companies with lower firm value. The specification test for IV method shows that the fitted probability is a good instrument because the test shows that the dummy variable W_{it} in equation (2) is endogenous.[5] Therefore, the instrumental variable method is preferred to the OLS method.

Results of the effects of specific company characteristics on firm value are interesting. Leverage has negative impact on firm value. Consistent with prior research on firm value, I find that profitability (*EBITDA*), capital expenditure (*CAPX*), and R&D

[5] To test whether the instrumental variable method is preferred to OLS method, I use Durbin-Wu-Hausman test as suggested by Davidson and Mackinnon (1993) "Estimation and Inference in Econometrics," New York, Oxford, Oxford University Press.

intensity (*R&D*) are value enhancing. The coefficients on these variables are positive and significant.

In summary, both the two-stage self selection method and the two-step IV method show that equity method investments enhance firm value. This finding, together with the findings from the probit analysis of the determinants of undertaking equity method investments, favors the economic efficiency hypothesis. I find that firms with more severe adverse selection problem, higher agency costs of debt and higher risk-shifting incentives are more likely to undertake equity method investments and the effect of equity method investments is a positive contribution to firm value.

4.4 Operating Performance

To examine the changes in operating performance of undertaking equity method investments, I conduct both univariate and multivariate analyses. Table VI summarizes the univariate analysis of operating performance in year *t+1, t+2*, and *t+3* in comparison with year *t*, where year *t* is the year in which a company is identified as a new user of equity method investments. Panel A reports the operating performance of equity method new users. Panel B reports the adjusted operating performance. The adjusted operating performance is calculated as the equity method new user operating performance minus the operating performance of the industry and size matched control firm.

The median industry and size adjusted free cash flow increases by 1.15% from year *t+1* to *t+2* (significant at 1% level), and 1.12% from year *t* to *t+3* (significant at

10% level). ROA also experiences an increase of 0.81% over the subsequent three years (significant at 10% level).

Overall, the univariate results show that there is some evidence of improvement in operating performance. The improvement in operating performance, especially the improvement in free cash flow, is consistent with the improvement in Tobin's q, since Tobin'q is the market value of the company scaled by assets and reflects the expected future free cash flows.

Table VII presents the multivariate analysis of changes in operating performance after undertaking equity method investments. The results relate to change in the respective operating performance measures from year *t* to *t+3*. The estimated coefficients on equity method decision dummy are positive and significant for all three operating performance measures after controlling for other factors that also impact performance. The results suggest that equity method investments can lead to improvement in firm's operating performance. The estimated coefficients on past changes in operating performance are negative and significant, indicating that past changes in operating performance are negatively correlated with future changes in operating performance. The estimated coefficients on the log of asset (*ASSET*), and market-to-book ratio (M/B) are generally insignificant.

5. Investors' Understanding of Off-Balance Sheet Risk

The equity method allows a company to report only its proportionate share of income from an unconsolidated entity on the income statement and its net investment in

the entity on the balance sheet, enabling the investor company to avoid balance sheet recognition of assets and liabilities of the unconsolidated entities. Hence, a particular concern about off-balance sheet financing is the possibility that firms may be more risky than they appear and that investors may be misled.

Previous literature has examined this issue in the case of research and development limited partnerships and/or organizations. Shevlin (1991) investigates how capital market investors view R&D limited partnership. He finds that investors are able to utilize the footnote disclosures to assess the value of R&D limited partnerships as a call option. Similarly, Beatty, Berger, and Magliolo (1995) find that the determinants of setting up R&D organizations are not related to subsequent stock returns or the issuance of seasoned equity, suggesting that managers of these firms may not have attempted to mislead investors.

To test whether investors correctly assess the risk of firms with equity method investments, I adopt the long-run stock return analysis approach used by many finance studies. If investors underestimate the company's risk, then the stock is likely to be overvalued. If such is the case, we would expect to observe negative abnormal returns for these firms in subsequent periods.

To estimate long-run returns, I use the calendar time portfolio approaches suggested by Fama (1998) and Mitchell and Stafford (2000). For each calendar month, investors buy stock in a company if it undertakes equity method investments, hold it for 12 months and then sell it out. Since companies disclose their equity method investments in annual reports and companies file their annual reports about 90 days after the end of

the fiscal year, firms are included in portfolios that are formed three months after the fiscal year end (for example, a December fiscal year-end company would be included in the portfolio formed in April through March of the following year). I regress the portfolio monthly return on the three factors specified in Fama-French (1993):

$$R_p\text{-}R_f = \alpha + \beta_1 * R_m\text{-}R_f + \beta_2 * SMB + \beta_3 * HML + \varepsilon \quad (5)$$

where R_p-R_f is the portfolio return adjusted by the risk free rate, R_m-R_f is the excess return on the market, *SMB* (small minus big) is the difference in returns of portfolios of "small" and "big" sized firms, and *HML* (high minus low) is the difference in returns of portfolios of high book-to-market and low book-to-market stocks. If investors correctly assess the risk and expected payoffs of companies that undertake equity method investments, the estimate of the intercept, α, is expected to be zero.

However, Mitchell and Stafford (2000) raise the possibility that when using calendar-time portfolio approach, the alpha under the null hypothesis may be biased. To control for this potential bias, I form a zero-investment strategy portfolio that is long in equity method new user firms and short in control firms that do not have equity method investments. For each equity method new user, the control firm is chosen from non-users from the same industry, same year, with size within 70% to 130% of the size of the new user. Of these selected non-users, the firm with book-to-market ratio that is closest to that of the new user is chosen as the control firm.

Table VIII reports calendar time Fama and French three-factor regression results. The first row of Panel A reports results of the portfolio of equity method new users. The dependent variable is the monthly return of the portfolio of new users. The independent

variables are the Fama-French factors. I interpret the estimated intercept coefficient, α, as the abnormal return in excess of what could be earned by passively investing in these factors. The estimated α is insignificant for the new user portfolio as well as the zero-investment portfolio based on both equal-weighted and value-weighted returns. This result suggests that investors correctly assess the risk of companies that have off-balance sheet debt through equity method investments.

While in general disclosures about off-balance sheet investments are adequate in informing investors about the firm's risk, recent changes in regulation suggest settings in which this may not hold. In particular, the "true" risk of a firm that guarantees the investee company's debt may not be fully disclosed under the existing reporting regime (before 2002). Companies are exposed to default risk associated with the principal and the unpaid interest when they guarantee the investee's debt. Since the limited disclosure of guarantees may hinder investors' ability to properly assess the risks involved with equity method investments, FASB issued FIN 45 in 2002 to regulate the disclosure and recognition of guarantee obligations. FIN 45 elaborates on the disclosure to be made by a guarantor in its interim and annual financial statements about its obligations under certain guarantees and to recognize, at the inception of a guarantee, a liability for the fair value of the obligation undertaken in issuing the guarantee. This new interpretation is also applicable to guarantees that arise from transactions or arrangements with equity method investees.

To examine investors' understanding of the risk associated with equity method investments in the presence of guarantees, I partition my sample of equity method new

users into two categories, equity method users with guarantees and equity method users without guarantees. Footnote disclosures about guarantees as required by SFAS 105 (effective 1990) are available in firms' 10-K reports. FIN 45 requires more extensive disclosures and actual recognition of fair values of guarantees in certain circumstances.

Panel B shows that the estimated α is negative and significant for the portfolio of new users with guarantees as well as for the zero-investment portfolio based on both equal- and value-weighted returns. On the other hand, for the portfolio of new users without guarantees (and the corresponding zero-investment portfolio), Panel C shows that the estimated α is insignificant for both equal- and value-weighted returns. Assuming that expected future payoffs are correctly priced by investors, these results can be interpreted as evidence that investors may underestimate the risk of firms with equity method investments when the investee's debt is guaranteed by the company. Thus, consistent with the regulator's concern, it is likely that for these firms the information about risk was not adequately conveyed to investors under the previous rules.[6]

6. Conclusion

After the Enron scandal, off-balance sheet arrangements have been subjected to tight financial reporting and disclosure regulation. Regulators and standard setters are particularly concerned that companies may use these entities to mislead investors.

[6]The negative abnormal returns do not necessarily imply that managers of these firms intentionally misled investors through balance-sheet management. In a multinomial analysis, I find that there are no systematic differences in the incentives for undertaking equity method investments for guarantors versus non-guarantors; moreover, I find improvement in subsequent operating performance for guarantors although weaker than that for non-guarantors.

Consequently, off-balance sheet arrangements have been viewed with suspicion. However, these arrangements can be motivated by sound economic reasons as suggested by some theoretical work.

In order to shed light on whether economic efficiency or managerial opportunism is the underlying driving force of off-balance sheet arrangements, I examine the determinants and consequences of one particular type of off-balance sheet arrangement, namely, equity method investments. I find that companies tend to undertake equity method investments when they have more information problems as indicated by more severe adverse selection problems, higher agency costs of debt and higher risk-shifting incentives. I also find that by undertaking equity method investments companies are able to mitigate information problems and realize economic gains. Further, I find that, in general, investors correctly assess the off-balance sheet risk of companies with equity method investments. However, investors appear to underestimate the risk associated with equity method investments when the company has guaranteed the investee's debt. These results provide some support for the FASB's concern regarding inadequate reporting in relation to guarantee obligations.

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Table I

Industry Distribution

	New Users	All Companies	Percentage of New Users in Industry
Business Equipments	17	501	3%
Chemicals	3	73	4%
Aircraft, Ships, Rail Road Equipment	1	24	4%
Personal and Business Services	20	430	4%
Fabricated Products	7	150	4%
Retail	10	203	5%
Restaurants, Hotels and Motels	4	74	5%
Petroleum and Natural Gas	8	132	6%
Consumer Goods	4	60	6%
Healthcare	27	399	6%
Textiles	1	14	7%
Food	6	82	7%
Books, Printing and Publishing	4	53	7%
Telecommunication	7	85	8%
Steel Works	5	59	8%
Construction	13	140	8%
Paper, Business Supplies, and Shipping	6	64	9%
Transportation	7	73	9%
Electrical Equipment	5	52	9%
Utility	17	170	9%
Mines, Precious Metals	2	18	10%
Others, including Conglomerate	2	18	10%
Recreation	10	80	11%
Wholesale	16	128	11%
Autos and Trucks	7	49	13%
Total	209	3187	7%

New users of equity method investments are identified as companies, which (i) invest at least 10% of total assets in equity method investments, and/or (ii) earn at least 10% of their income before extraordinary items from equity earnings for the first time in any given year, and (iii) have non-substantial equity method investments in the prior year. Non substantial equity method investments are defined as investments less than 2% of total assets and/or earnings less than 2% of income before extraordinary items.

Table II

Descriptive Statistics

	New Users		Non-Users		Test of Difference	
	Mean	Median	Mean	Median	T-Test	Wilcoxon Signed Rank test
ASSETS (millions)	2411	354	1207	181	(0.00)	(0.00)
MV (millions)	1682	272	1127	170	(0.00)	(0.01)
LEV	0.366	0.416	0.325	0.345	(0.09)	(0.07)
M/B	3.217	1.987	2.595	2.051	(0.05)	(0.98)
SALESGR	0.311	0.119	0.248	0.140	(0.23)	(0.70)
R&D	0.152	0.000	0.056	0.000	(0.03)	(0.31)
RETVOL	0.502	0.441	0.458	0.428	(0.08)	(0.31)
INSTU	0.379	0.369	0.378	0.374	(0.94)	(0.88)
KZ	0.456	0.644	0.269	0.346	(0.11)	(0.06)
FOREIGN	0.531	1.000	0.416	0.400	(0.02)	(0.02)
RATING	0.360	0.000	0.311	0.000	(0.25)	(0.26)

New users of equity method investments are defined in Table I. Non-users are firms with missing value or zero amounts for data31, data55, and data106 in the current as well as the prior year. New users are matched with non-users by year and industry (Fama and French 30-industry classification) and one non-user is randomly assigned as the control firm for each new user. The statistics for the matched control firms are presented under the column "Non-Users".

Variable definitions: *ASSETS* are book value of total assets. *MV* is the market value of equity. *LEV* is long-term debt plus current portion of long-term debt divided by book value of total shareholders' equity. *M/B* is market value of common equity divided by book value of equity. *SALESGR* is the average sales growth from year t-5 through year t-1, with a minimum three-year data requirement. *R&D* is R&D expense divided by net sales, where missing R&D expense is set to zero. *RETVOL* is the standard deviation of monthly stock returns over years t-3 through t-1 multiplied by $12^{1/2}$. *KZ* is the Kaplan-Zingales financial constraint index which is a composite of financial ratios (1.002*Cash flow-39.368*Dividend-1.315*Cash+3.139*LEV, see Section 3.2.1 for further details). *INSTU* measures the percentage of shares owned by institutional holders collected from CDA/Spectrum Institutional (13f) database which contains the filings made under section 13f to the Securities and Exchange Commission. *FOREIGN* equals 1 if a firm reports foreign segments in its annual report, and zero otherwise. *RATING* equals one if a firm's debt is rated, and zero otherwise.

P-values are reported in parentheses.

Table III

Pearson Correlations of Firm Characteristics

	SALESGR	M/B	LEV	INSTU	RATING	RETVOL	ASSET	FOREIGN	R&D
SALESGR	1								
M/B	0.13***	1							
LEV	-0.08	-0.10**	1						
INSTU	-0.15***	-0.07	-0.06	1					
RATING	-0.13***	-0.02	0.34***	0.34***	1				
RETVOL	0.29***	0.32***	-0.14***	-0.33	-0.33	1			
ASSET	-0.20***	-0.14***	0.39***	0.52***	0.64***	-0.48***	1		
FOREIGN	-0.13***	-0.05	-0.08	0.22***	0.06	-0.15***	0.18***	1	
R&D	0.23***	0.34***	-0.23***	-0.11**	-0.14***	0.39***	-0.22***	-0.08	1
KZ	-0.05	-0.16***	0.78***	-0.16***	0.12***	0.04	0.11**	-0.13***	-0.20***

ASSET is defined as the log of total assets. All variables are defined in Table II. ***, **, * denote significance at 1%, 5%, 10% levels, respectively.

Table IV

Determinants of the Decision to Undertake Equity Method Investments

		Prediction	Coefficients	Coefficients
Growth:	M/B	+	-0.028	-0.022
			(0.19)	*(0.29)*
	SALESGR	+	0.115	0.120
			(0.24)	*(0.18)*
Financial constraint :	LEV	+	-0.352	-1.076
			(0.21)	*(0.04)*
	KZ	+		0.170
				(0.04)
Underinvestment:	LEV*M/B	+	0.213	0.217
			(0.02)	*(0.02)*
Info Asymmetry:	INSTU	-	-0.529	-0.560
			(0.06)	*(0.05)*
	RATING	-	-0.189	-0.175
			(0.14)	*(0.16)*
Risk:	RETVOL	+	0.829	0.725
			(0.06)	*(0.02)*
Controls:	ASSET	+	0.238	0.260
			(0.00)	*(0.00)*
	FOREIGN	+	0.337	0.348
			(0.06)	*(0.00)*
	R&D	+	0.476	0.511
			(0.02)	*(0.02)*
Log likelihood			-268	-267
Prob>chi2			0.00	0.00
Pseudo R square			7.58%	8.09%
# of observations			418	418

This table reports the results of a probit regression of the determinants of the decision to undertake equity method investments (equation (1) in the text). The dependent variable is a dummy variable that equals one if the company is a new user of equity method investments and zero if the company is a control non-user. New user of equity method investments are defined in Table I and control non-users are defined in Table II.

All explanatory variables are defined in Tables II and III and are measured at the end of year *t-1*, where *t* is the year in which a company is identified as a new user of equity method investments. P-values are reported in parentheses (one-tailed test is used whenever appropriate).

Table V

Effect of Equity Method Investments on Firm value (Tobin's q)

	$\log(Q_t)$			$\log(Q_{t+1})$		
	I	II	III	IV	V	VI
	OLS	Self-selection	IV	OLS	Self-selection	IV
W	0.00	0.84	0.87	-0.14	0.56	0.64
	(0.99)	*(0.00)*	*(0.00)*	*(0.77)*	*(0.05)*	*(0.05)*
ASSET	0.02	-0.06	-0.07	-0.01	-0.04	-0.05
	(0.33)	*(0.01)*	*(0.00)*	*(0.40)*	*(0.07)*	*(0.06)*
CAPX	1.07	1.22	1.45	1.15	1.26	1.65
	(0.01)	*(0.00)*	*(0.00)*	*(0.01)*	*(0.00)*	*(0.00)*
LEV	-0.55	-0.53	-0.55	-0.54	-0.56	-0.61
	(0.00)	*(0.00)*	*(0.00)*	*(0.00)*	*(0.00)*	*(0.00)*
EBITDA	0.87	0.87	1.56	0.57	0.70	1.05
	0.00	*(0.02)*	*(0.00)*	*(0.14)*	*(0.00)*	*(0.01)*
R&D	0.32	0.45	0.65	0.19	0.16	0.16
	(0.00)	*(0.01)*	*(0.00)*	*(0.02)*	*(0.01)*	*(0.02)*
lambda		-0.55			-0.37	
		(0.00)			*(0.04)*	
Adj. R square	0.30	0.38	0.23	0.28	0.30	0.37
N	418	418	418	409	409	409

The table reports the regression results of the effects of equity method investments on firm value (equations (2) and (3) in the text). Dependent variable is the log of Tobin's q. Tobin's q is defined as market value of equity (price*shares outstanding) plus book value of assets minus book value of equity (data6-data60-data74) divided by book value of assets. Columns I-III report results with $\log(Q_t)$ and Columns IV-VI report results with $\log(Q_{t+1})$. Independent variables are measured at the end of year *t* and year *t+1*, respectively, where *t* is the year a company is identified as a new user of equity method investments. *W* equals one if the company is a new user of equity method investments and zero if the company is a control non-user. New user is defined in Table I and control non-user is defined in Table II.

CAPX is capital expenditure divided by beginning total assets. EBITDA equals earnings before interest, taxes, depreciation and amortization, divided by beginning total assets. *lambda* is the self selection parameter. All other independent variables are defined in Tables II and III. All models include industry and year fixed effects (coefficient estimates not reported). P-values of two-tailed tests are given in parentheses.

Table VI

Median Changes in Operating Performance of New Users of Equity Method Investments

	Year over year				Cumulative
	year t-1 to year t	year t to year t+1	year t+1 to year t+2	year t+2 to year t+3	year t to year t+3
Panel A: New user performance					
Change in operating income	-1.50***	0.51	0.23	0.46	0.64
Change in ROA	-0.44	0.61	0.16	0.28	0.61
Change in free cash flow	-1.25*	0.51	0.54*	0.04	1.57**
Panel B: Industry and size adjusted performance					
Change in operating income	-1.23	-0.83	0.81	0.02	0.85
Change in ROA	-0.03	-0.29	0.61	0.02	0.81*
Change in free cash flow	-0.49	0.08	1.15***	0.2	1.12*

New users of equity method investments are defined in Table I. Industry and size adjusted performance is the difference between new user's operating performance and the operating performance of industry and size matched non-user. The industry and size matched non-user is selected as follows: (i) for each new user of equity method investments, non-users from the same industry (Fama and French 30-industry classification) and same year are selected as candidate non-users, and (ii) the candidate non-user with the closest match in market value is selected as the control firm.

Variable definitions: Operating income is defined as earnings before depreciation, amortization, interest and taxes divided by beginning total assets. ROA is defined as earnings before extraordinary items divided by beginning total assets. Free cash flow is defined as earnings before depreciation, amortization, interest and taxes minus capital expenditure divided by beginning total assets. All variables are reported in percentage.

***, **, * denote significance at 1%, 5%, and 10% levels, respectively, based on two-tailed Wilcoxon signed rank test.

Table VII

Multivariate Analysis of Changes in Subsequent Operating Performance

	Independent Variables				
Dependent Variable	W_t	$\Delta OP_{t-3,\,t}$	$ASSET_t$	M/B_t	Adj R^2
$\Delta ROA_{t,\,t+3}$	0.028**	-0.017**	0.002	-0.003	5.60%
	(0.02)	*(0.02)*	*(0.65)*	*(0.36)*	
$\Delta EBITDA_{t,\,t+3}$	0.035***	-0.01**	0.006	-0.005	7.30%
	(0.01)	*(0.03)*	*(0.15)*	*(0.14)*	
$\Delta FCF_{t,\,t+3}$	0.035**	-0.009*	0.012***	0.002	3.27%
	(0.02)	*(0.07)*	*(0.01)*	*(0.95)*	

This table reports the results of the regression of changes in operating performance on the decision to undertake equity method investments (equation (4) in the text). The dependent variables are $\Delta ROA_{t,t+3}$, $\Delta EBITDA_{t,t+3}$, and $\Delta FCF_{t,t+3}$, respectively. $\Delta ROA_{t,t+3}$ is defined as the cumulative change in *ROA* from year t to t+3, where t is the year when a company is identified as equity method investment new user. *ROA* is defined as earnings before extraordinary items divided by beginning total assets. $\Delta EBITDA_{t,t+3}$ is defined as the cumulative change in *EBITDA* from year *t* to *t+3*. *EBITDA* is defined as earnings before depreciation, amortization, interest and taxes minus capital expenditure divided by beginning total assets. $\Delta FCF_{t,t+3}$ is defined as the cumulative change in *FCF* from year *t* to *t+3*. *FCF* is defined as earnings before depreciation, amortization, interest and taxes minus capital expenditure divided by beginning total assets.

The explanatory variables include W_t, $ASSET_t$, M/B_t, $\Delta OP_{t-3,\,t}$ and industry and year dummies. W_t equals one if the company is a new user of equity method investments and zero if the company is a control non-user in year t. $ASSET_t$ is log of total assets. $\Delta OP_{t-3,t}$ is the cumulative change in ROA, EBITDA, and FCF from year t-3 to t, respectively. The estimated coefficients on intercept, industry and year dummies are omitted.

Table VIII

Subsequent Abnormal Returns For New Users of Equity method investments

	Equal-Weighted				Value-Weighted			
	α	R_m-R_f	SMB	HML	α	R_m-R_f	SMB	HML
Panel A: Full Sample								
User portfolio	-0.011	1.24	0.147	0.275	0.001	1.174	0.705	0.419
	(0.11)	*(0.00)*	*(0.43)*	*(0.24)*	*(0.79)*	*(0.00)*	*(0.00)*	*(0.02)*
Hedge portfolio	-0.009	-0.02	0.146	-0.122	-0.007	0.103	-0.169	0.252
	(0.26)	*(0.92)*	*(0.45)*	*(0.62)*	*(0.23)*	*(0.52)*	*(0.29)*	*(0.21)*
Panel B: Subsample With Guarantees								
User portfolio	-0.017	1.133	0.076	0.829	-0.007	1.308	0.364	0.832
	(0.02)	*(0.00)*	*(0.72)*	*(0.00)*	*(0.29)*	*(0.00)*	*(0.05)*	*(0.00)*
Hedge portfolio	-0.014	-0.084	-0.148	0.662	-0.017	0.284	-0.558	0.639
	(0.09)	*(0.73)*	*(0.53)*	*(0.03)*	*(0.03)*	*(0.20)*	*(0.01)*	*(0.02)*
Panel C: Subsample Without Guarantees								
User portfolio	-0.006	1.204	0.472	0.139	0.004	1.063	0.829	0.265
	(0.46)	*(0.00)*	*(0.02)*	*(0.59)*	*(0.54)*	*(0.00)*	*(0.00)*	*(0.20)*
Hedge portfolio	-0.003	-0.02	0.146	-0.122	-0.004	-0.007	-0.045	0.099
	(0.64)	*(0.92)*	*(0.45)*	*(0.62)*	*(0.52)*	*(0.97)*	*(0.81)*	*(0.66)*

The table reports the results of Fama and French three-factor regression (equation (5) in the text) of equal- and value-weighted monthly returns for the portfolio of equity method new users and the zero-investment strategy portfolio. Panel A reports the results of the full sample of equity method new users. Panel B reports the results of equity method new users with guarantees. Panel C reports results of equity method new users without guarantees. The guarantee data is collected from 10-K reports. For each panel, the first row reports the results of investing in the portfolio of equity method new users. The second row reports results of investing in a zero-investment strategy portfolio that is long in equity method new users and short in matched control firms of non-users in each calendar month. Firms are included in the portfolios three months after the fiscal year end (for example, a December year-end firm would be included in the portfolio formed in April through March of the following year) and held for 12 months and sold out.

The explanatory variables are R_m-R_f, *SMB and HML,* where R_m-R_f is the excess return on the market, *SMB* is the difference in returns between a portfolio of "small sized" and a portfolio of "big sized" stocks, and *HML* is the difference in returns between a portfolio of "high book-to-market" and a portfolio of "low book-to-market" stocks. The estimate of the intercept coefficient, α, measures the monthly abnormal return given the model. P-values are reported in parentheses.