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ABSTRACT

The Modigliani and Miller propositions on the irrelevancy of capital structure and dividends are shown to be valid in a large class of models with asymmetric information. The main assumption is that managerial compensation is chosen optimally. This differs from most recent papers on this topic, which impose by fiat a suboptimal contract. Even when imperfections internal to the firm preclude optimal investment, there is a separation between incentives and financing. We also show that making prices reflect idiosyncratic information more accurately does not make investors better off, thus negating the motivation of many of the signalling models.

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1. Introduction

The Modigliani and Miller (M-M) irrelevancy propositions tell us that capital structure and dividend policy are a matter of irrelevance in the absence of transaction costs, taxes, and informational asymmetries. A number of recent papers have models with asymmetric information in which the irrelevancy propositions do not hold. By contrast, this paper shows that the Modigliani-Miller irrelevancy propositions are still valid in many reasonable models with incomplete information. The main difference between our paper and the existing literature is in the manager's assumed incentives: while we determine the manager's incentives as an optimal choice, existing papers in this literature tend to assume incentives that are suboptimal. There is also an implicit assumption made in many of these papers that it is useful for managers to signal information about the firm to the market. In fact, if the information possessed by managers is firm specific in nature, this implicit assumption is incorrect.

The starting point for our analysis is Myers and Majluf (1984), a distinguished representative of the literature we are criticizing. Myers and Majluf consider several suboptimal contracts, but we will focus on their leading case, which is a manager who is acting on behalf of existing shareholders who invest for the long run. This may sound like a reasonable contract, but as demonstrated by Myers and Majluf the manager has an incentive to follow a distorted investment policy. Specifically, suppose the manager has private information about existing projects and private information about a new project. If the manager observes very good news about the existing projects, then the manager knows that the stock price for a new issue would be too low, and the manager will refrain from taking on a new project that is only modestly profitable. Of course, this suboptimal behavior is anticipated by investors and results in an initial offering price that is lower than it would be if the investment policy were optimal.

In Section 2, we develop a series of optimal contracting models using the Myers and Majluf framework. In these models we show that investment is optimal, capital structure is irrelevant, and dividend policy is irrelevant. The optimality of investment is due to a special feature of Myers and Majluf that there are no imperfections in the firm. (For example, the first-best solution would be infeasible in the presence of an agency problem caused by the value of costly effort by the manager). We discuss the more general result of separation between financing and investment, which says that financing does not affect the value of the firm in the presence of imperfect information, provided the market does not generate information that is valuable to the manager or to those agents evaluating the manager, and provided costly information gathering does not depress the market price.
Section 3 contains an example illustrating that the current stylized facts concerning the reaction of stock price to debt and equity issues is consistent with our general theoretical framework in which the Modigliani-Miller propositions hold. The idea behind the example is that in very good states, the existing project generates the funds needed to undertake any new project, and therefore having a new issue is bad news. If the manager has good news about the new project but bad news about the old project, the manager raises debt, which is only slightly bad news. If the manager has bad news about both new and old projects, the manager raises equity, which is very bad news. All of this is consistent with optimal investment. Therefore, we see that even if the empirical evidence agrees more or less

with Myers and Majluf, this is not convincing proof that their story is correct; the same empirical evidence is consistent with optimal investment in a world consistent with the Modigliani-Miller irrelevancy propositions.

In Section 4, we analyze the question of whether it is valuable to investors to have the firm signal information to them. Following Ross (1985) (which was developed in an investments context), we argue that agents are indifferent to early release of information about idiosyncratic noise, which is necessarily the nature of the information the manager possesses. Section 5 closes the paper.

2. The Model

In the simplest model of Myers and Majluf (1984), the manager is assumed to act in the best interest of shareholders who hold their stock through to the end. The manager has private information both about the value of existing assets in place and about the value of a new potential investment. When the new project is marginally profitable and the existing investment is enough more profitable than average, the manager knows that the issue price of the shares will be significantly less than their intrinsic value. Because of the manager's incentive to protect original investors who hold to the end, the manager will perceive a loss due to the underpricing of the new shares. If this perceived loss is larger than the profitability of the investment, the manager will refrain from making the new investment. The perceived loss is not an economic loss (it is a transfer) and therefore the manager will sometimes reject profitable projects. This rejection of profitable projects is the inefficiency in the Myers and Majulf model.

Optimal Investment

Our first model follows Myers and Majluf's first model very closely, except that the manager's incentive contract is chosen endogenously.[†] We study a single firm existing over three periods *0*, *1*, and *2*. In period *0*, the firm is set up by an entrepreneur who invests an amount I^a in the firm's initial project, hires a manager, and chooses the manager's contract taking into account the manager's reactions to the incentives built into the contract. In this initial period, all agents have the same information, which includes knowledge of the distributions of the exogenous random variables ($\tilde{a}$ and $\tilde{b}$, to be introduced shortly) and the structure of the problems faced by all agents. In period *1*, the manager learns two pieces of private information: the realization a of the profit $\tilde{a}$ (in excess of I^a) to the capital in place, and the realization b of the prospective profit $\tilde{b}$ (in excess of I^b) of a new investment opportunity requiring an investment I^b. After observing a and b, the manager chooses whether or not to undertake the new investment project. We code the manager's choice using d: $d = 1$ if the manager undertakes the new investment, and $d = 0$ if not. The manager's choice is made known to the public, and if the new investment is undertaken, the firm issues new equity worth I^b to finance the project. (We will consider later the possibility that the manager may choose to issue debt instead.) In period *2*, all payoffs are realized, and the public learns the total profit $a+db$. It is reasonable that the public learns $a+db$ but never learns a and b separately, because we think of the new project as being inextricably tied to the original project. For example, the new project may

[†]Myers and Majluf did express concern for the choice of managerial contract, and considered several alternatives. They did not, however, consider an optimal contract.

be an upgrading of the capital used in the original project. (If the payoffs were ultimately separable, there is no reason why the new project could not be spun off as a separated firm.) At the end of period *2*, the manager is compensated and the residual goes to the shareholders.[†]

We retain Myers and Majluf's assumptions that all agents are risk neutral and that there is no discounting. End-of-period equity prices, P_0, P_1, and P_2, (P_0, P_1, and P_2 are the end of period prices of the time *0* issue of equity) are formed rationally. The price at each time can depend only on the public's information at that time; therefore we can write the equilibrium pricing functions as P_0 (there is "no" public information at *0*), $P_1(d)$, and $P_2(d,a+bd)$. (We could make P_2 depend on P_1 as well, but this is redundant.) The manager's choice of d is based on the manager's information at time *1*, namely a and b, and therefore we have the manager's decision rule $d(a,b)$. The agent's compensation scheme (sharing rule) $s(a+bd,d,P_1,P_2)$ is permitted to depend on all publicly available information at the end of time *2*.[‡] As in Myers and Majluf, the manager cannot trade on own account to undo the incentive contract with the firm. Rents extracted from the manager are

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[†]Taken literally, the formal statements of the choice problems would imply that shareholders are also assessed for any shortfall. This is an inessential feature of the model. We could assume that $I^a+\tilde{a}$ and $I^b+\tilde{b}$ are never negative and that s is constrained to leave non-negative residual without changing the solution to our problem, provided the manager's reservation utility level is not too large. We refrain from doing so because doing so would complicate the statement of the problem without increasing its economic content.

[‡]As with P_2, it is formally redundant to include P_1 and P_2. In fact, this simple observation is one theme of the paper: optimal contracting is independent of financing because using market prices cannot improve on contracts which already exploit the public information on which the market prices are based. Including P_1 and P_2 *is* required if we want to admit explicitly the contracts used by Myers and Majluf.

limited by the agent's reservation utility level $U^{*} > 0$. We assume that $U^{*} < I^{a}$ and $E[\tilde{a}] > 0$, and therefore it is optimal to form the firm in the first place. We also assume that $\tilde{a}$ and $\tilde{b}$ both have compact support, and to avoid discussions of ties we assume $Prob(\tilde{b}=0) = 0$.

The entrepreneur faces Problem I, which is given in Table 1. The entrepreneur is to choose a managerial compensation scheme and resultant optimal decision rule and rational equilibrium price functions to maximize the proceeds from the initial public offering. For simplicity, it is assumed that the entrepreneur retains no equity. The issue price for the initial public offering, P_0, is the sunk investment in place, I^{a}, plus expected profit $\tilde{a}+\tilde{b}d(\tilde{a},\tilde{b})$, less the manager's compensation $s^{*}(\tilde{a},\tilde{b})$. This is because the issue of stock in the competitive market will capture all the rents net of expenses (taking into account the possibly inefficient investment represented by $d(a,b)$). Also, we assume that the firm has no financial slack, because existence of slack does not affect our results.

Table 1: The Entrepreneur's Choice Problem I

Choose a compensation scheme $s(a+bd,d,P_1,P_2)$, an equilibrium decision rule $d^*(a,b)$, and pricing rules $P_1(d)$ and $P_2(d,a+bd)$, to maximize the initial offering price $P_0 = E[I^a+\tilde{a}+\tilde{b}d^*(\tilde{a},\tilde{b})-s^*(\tilde{a},\tilde{b})]$ subject to

(1) Manager's equilibrium payoff

$$s^*(a,b) \equiv s(a+bd^*(a,b),d^*(a,b),P_1(d^*(a,b)),P_2(d^*(a,b),a+bd^*(a,b)))$$

(2) Rationality of prices

(a) $P_1(d) = E[I^a+\tilde{a}+\tilde{b}d-s^*(\tilde{a},\tilde{b})\,|\,d^*(a,b)=d]$

(b) $P_2(d,a+bd) = \dfrac{P_1(d)}{P_1(d)+I^b d}[I^a+I^b d+(a+bd)-s(a+bd,d,P_1(d),P_2(d,a+db))]$

(3) Incentive compatibility of the investment decision

The decision rule $d^*(a,b)$ is the solution to the manager's problem

Choose $d(a,b)$ to

max $E[s(\tilde{a}+\tilde{b}d(\tilde{a},\tilde{b}),d(\tilde{a},\tilde{b}),P_1(d(\tilde{a},\tilde{b})),P_2(d(\tilde{a},\tilde{b}),\tilde{a}+\tilde{b}d(\tilde{a},\tilde{b}))]$

s.t. $(\forall a,b)\ d(a,b) = 0 \text{ or } 1$

and $(\forall a,b)\ s(a+bd(a,b),d(a,b),P_1(d(a,b)),P_2(d(a,b),a+bd(a,b))) \geq 0.$

(4) Manager's reservation utility constraint

$E[s^*(\tilde{a},\tilde{b})] \geq U^*.$

Differences with Myers and Majluf:

(1) The manager's contract $s(a+bd,d,P_1,P_2)$ is not fixed exogenously. The contract most emphasized by Myers and Majluf is action on behalf of existing shareholders who plan to hold to the end, which amounts to taking $s(a+bd,d,P_1,P_2)$ to be equal to a constant plus a tiny proportion of P_2.

(2) The profit levels a and b are not separately observable by the public at the end, or we could directly force the manager to follow any decision rule $d(a,b)$ we choose.

(3) The profitability $\tilde{b}$ of the new project is sometimes negative, or else a forcing contract requiring $d=1$ could achieve the first-best.

The first constraint is simply the expression for the manager's equilibrium payoff, which is based on equilibrium prices and the equilibrium decision rule. Having this as a separate constraint saves us from having to write the expression on the right hand side everywhere $s^*(\tilde{a},\tilde{b})$ now appears. The first rationality of prices constraint (a) follows directly from competitive risk-neutral pricing in the securities market. This expression is the same as the expression for P_0, except conditioned on public information at time 1. The second rationality of prices constraint (b) takes into account the liquidation value of the firm and the dilution from the share issue (if any) at time 1. The fraction multiplying the expression in square brackets is the fraction of the firm ownership represented by the original shares. The expression in square brackets is the realized value of investments, less the manager's compensation.

The third constraint is the standard incentive compatibility constraint encountered in agency problems. This constraint says that the manager understands the incentives and solves the maximization problem implicit in those incentives. Finally, the manager's equilibrium payoff must satisfy a reservation utility constraint, or else the manager will not accept the offer of employment.

The first-best optimum is the solution that would arise in the absence of the moral hazard and signalling problems. In Problem I, the first-best optimum is the solution to the problem where we require only feasibility but not optimality for the incentive compatibility problem. In other words, we would maximize the offering price, subject to constraints (1), (2), and (4), and the constraints to the incentive compatibility problem. Because of the risk neutrality, the solution to this problem is trivial. We will simply satisfy the manager's reservation utility constraint with an equality. The objective function can therefore be written as $P_0 = I^a + E[\tilde{a}] + E[\tilde{b}d(\tilde{a},\tilde{b})] - U^*$. Only the third term is not a constant, and therefore the optimal strategy is to maximize the third term, that is, to take $d^*(a,b) = 1$ whenever $b > 0$ and to take $d^* = 0$ whenever $b < 0$. To fill out the solution, we must choose a compensation scheme and equilibrium pricing rules. But, we can simply choose $s(\cdot,\cdot,\cdot,\cdot,\cdot) \equiv U^*$, and we can define the price functions by the rationality constraints. In other words, the first-best optimum is characterized by efficient production: profitable new projects are always undertaken and money-losing projects are never undertaken.

This first-best optimal solution is also a solution to the second-best problem (Problem I), technically speaking. Because the compensation function is flat, every decision rule is optimal. This points to a weakness of the Myers-Majluf framework: because there is no costly effort on the part of the manager, there is nothing in the model to suggest that we cannot simply pay the manager a fixed wage, explain to the manager what is to be done, and expect that the manager will follow instructions.[†]

More interestingly, we can also obtain the first-best as the unique optimum if we choose P_1 and P_2 to satisfy the rationality of pricing constraints for

[†]There is an argument that a manager who is indifferent is a particularly easy target for bribes by interested parties. It seems that this type of argument is particularly inappropriate in a paper about the Modigliani-Miller propositions, because whenever we have irrelevance there is indifference. (Of course, this does affect our interpretation: when there is indifference (or irrelevance), apparently "second-order" considerations can have a large affect on the outcome.)

$$d^*(a,b) = 1 \qquad \text{for } b > 0$$

$$\qquad\; = 0 \qquad \text{otherwise}, \tag{1}$$

and choose

$$s(a+bd,d,P_1,P_2) = \alpha + \beta(a+bd), \tag{2}$$

where α and $\beta > 0$ are constants chosen to make the reservation utility constraint an equality and $s^*(\tilde{a},\tilde{b}) > 0$. (This is feasible for β small enough because $\tilde{a}$ and $\tilde{b}$ both have compact support.) Clearly, this incentive structure supports the first-best optimum as the unique solution to the agent's decision problem.

Because we can use P_1 and P_2 to measure $a+bd$ indirectly, the optimal contract is indeterminate (beyond the choice of β in (2)). One economically interpretable alternative is to take

$$s(a+bd,d,P_1,P_2) = \alpha' + \beta\left[P_2 + I^b d \frac{(P_2 - P_1)}{P_1}\right] \tag{3}$$

with the decision rule in (1) and the prices determined by the rationality of pricing constraint and where α' and $\beta' > 0$ are chosen to maintain positivity and the reservation utility constraint. The contract (3) is equivalent to (2) with $\beta = \beta'/(1+\beta')$ and $\alpha = (\alpha'+\beta' I^a)/(1+\beta')$, as can be seen by substituting the rationality of pricing constraint for P_2 into (3) and solving for s. Therefore, the incentives are the same. The interpretation of the contract (3) is that the manager is paid a constant plus a term proportional to the portfolio of the initial stock plus a *pro rata* purchase and participation in new issues. In this way, if the price is out of line, the effect of mispricing on existing shares is completely offset by the effect of mispricing on the *pro rata* purchase of new shares. For example, if the manager knows that a is very large, the prospective capital loss on the existing shares (the dilution effect) is exactly offset by the windfall gain on the implicit purchase of new shares. The net effect is to make the manager indifferent about the price at which the share issue is made, which leads to optimal investment. The share price is correct on average, but does not fully reflect the manager's information in each state of nature.†

How does this solution relate to the Myers and Majluf model? Leaving aside some slight technical differences, the main difference is that Myers and Majluf assumed by fiat the incentives faced by the manager. The Myers and Majluf incentives are consistent with the compensation scheme

$$s(a+bd,d,P_1,P_2) = \alpha'' + \beta'' P_2 \tag{4}$$

for some small $\beta'' > 0$ where α'' chosen to satisfy the reservation utility constraint. To compare the Myers and Majluf compensation schedule with the optimal one, note that if we think of the manager's compensation as much smaller than the value of the firm, the rationality of prices constraint for P_2 implies that Myers and Majluf scheme is approximately

$$s(a+bd,d,P_1,P_2) \approx \alpha'' + \beta'' \frac{P_1(d)}{P_1(d)+I^b d} [I^a+I^b d+(a+bd)]. \tag{5}$$

†It may surprise the reader that this inefficiency of pricing does not represent an economic (Pareto) inefficiency. A general discussion of this feature is the subject of Section 4.

In other words, the Myers and Majluf compensation scheme differs from the optimal scheme in that the Myers and Majluf manager cares about the degree of dilution as determined by the price at time 1, and not just about the profitability of the investments.

Optimal Capital Structure

In Problem I, we assumed that the manager financed all new investments using equity exclusively. In this section, we look at an analogous problem (Problem II) that allows the manager to finance new investments using a mix of debt and equity selected by the manager. Problem II is contained in Table 2. The main change from Problem I is the inclusion of a manager's choice of face value of debt, bond prices for that debt, and the effect of the leverage on the stock price. The bond price in each period depends only on public information and can influence the manager's compensation. The new constraint simply ensures that there is some equity remaining in the firm; literally, it says that the value of the bond issue does not exceed the value of the firm.

Other features of the new choice problem represent an attempt to keep the notation somewhat under control. For example, we have not precluded a "short" bond issue, that is, issuing equity to buy bonds, nor have we precluded a swap of equity for debt. (We have precluded a swap of debt for equity but only "accidentally," since we start with an all-equity firm.) These assumptions keep the choice problem from being even messier without affecting the economic message.

Table 2: The Entrepreneur's Choice Problem II

Choose a compensation scheme $s(a+bd,d,F,P_1,P_2,B_1,B_2)$, equilibrium investment decision $d^*(a,b)$, equilibrium face value of debt $F^*(a,b)$, and pricing rules $P_1(d,F)$, $P_2(d,F,a+bd)$, $B_1(d,F)$, and $B_2(d,F,a+bd)$, to maximize initial offering price $P_0=E[I^a+\tilde{a}+\tilde{b}d^*(\tilde{a},\tilde{b})-s^*(\tilde{a},\tilde{b})]$ subject to

(1) Manager's equilibrium payoff

$$s^*(a,b) \equiv s(a+bd^*(a,b),d^*(a,b),F^*(a,b),P_1(d^*(a,b),F^*(a,b)),$$
$$P_2(d^*(a,b),F^*(a,b),a+bd^*(a,b)),B_1(d^*(a,b),F^*(a,b)),$$
$$B_2(d^*(a,b),F^*(a,b),a+bd^*(a,b)))$$

(2) Rationality of prices

(a) $P_1(d,F) = E[I^a+\tilde{a}+\tilde{b}d-s^*(\tilde{a},\tilde{b})\,|\,d^*(a,b)=d \text{ and } F^*(a,b) = F]$

(b) $$P_2(d,F,a+bd) = \frac{P_1(d,F)}{P_1(d,F)+I^bd-B_1(d,F)}\,[\max(0,I^a+I^bd+(a+bd)-F$$
$$-s(a+bd,d,F,P_1(d,F),P_2(d,F,a+db)),B_1(d,F),B_2(d,F,a+db)))]$$

(c) $B_1(d,F) = E[\min(F,I^a+I^bd+(\tilde{a}+\tilde{b}d)-s^*(\tilde{a},\tilde{b}))\,|\,d^*(a,b)=d \;\&\; F^*(a,b)=F]$

(d) $$B_2(d,F,a+bd) = \min(F,\ [I^a+I^bd+(a+bd)\ -$$
$$s(a+bd,d,F,P_1(d,F),P_2(d,F,a+db),B_1(d,F),B_2(d,F,a+db))])$$

(3) Incentive compatibility of the investment decision

The decision rule $d^*(a,b)$ and choice of face value $F^*(a,b)$ solve

Choose $d(a,b)$ and $F(a,b)$ to

$$\max E[s(\tilde{a}+\tilde{b}d(\tilde{a},\tilde{b}),d(\tilde{a},\tilde{b}),F(\tilde{a},\tilde{b}),P_1(d(\tilde{a},\tilde{b}),F(\tilde{a},\tilde{b})),$$
$$P_2(d(\tilde{a},\tilde{b}),F(\tilde{a},\tilde{b}),\tilde{a}+\tilde{b}d(\tilde{a},\tilde{b})),B_1(d(\tilde{a},\tilde{b}),F(\tilde{a},\tilde{b})),$$
$$B_2(d(\tilde{a},\tilde{b}),F(\tilde{a},\tilde{b}),\tilde{a}+\tilde{b}d(\tilde{a},\tilde{b})))]$$

s.t. $(\forall a,b)$ $d(a,b) = 0$ or 1, $(\forall a,b)$ $F(a,b) \geq 0$, and $(\forall a,b)$

$$s(a+bd(a,b),d(a,b),F(a,b),P_1(d(a,b),F(a,b)),B_1(d(a,b),F(a,b)),$$
$$P_2(d(a,b),F(a,b),a+bd(a,b)),B_2(d(a,b),F(a,b),a+bd(a,b)) \geq 0.$$

(4) Manager's reservation utility constraint: $E[s^*(\tilde{a},\tilde{b})] \geq U^*$.

(5) Positive equity at end of period 1: $B_1(d,F) < P_1(d,F) + I^bd$.

As before, the first-best solution has an investment policy to undertake only the new projects that are economically profitable while paying the manager the reservation utility. Subject to the constraint of leaving some equity in the firm, capital structure is completely irrelevant, as can be seen by the fact that it does not appear in the objective function. (This is due to the rational competitive pricing of any issues at time *1*. The fact that pricing at time *1* does not reflect the manager's information has absolutely no effect on the price at time *0*.) This is effectively the irrelevancy of capital structure proposition in the absence of information asymmetries (because the first-best solution is what arises if all information is shared).

As in Problem I, the first-best solution is formally a solution to Problem II. What is more interesting is to look for a solution in which the manager has positive incentives to undertake the first-best. To do so, it is necessary for the size of the debt issue $F^*(a,b)$ to be a function of d and $a+bd$, which is all the market observes (directly or through the manager's actions, with or without noise). In any first-best, knowing d tells us precisely whether $b \gtrless 0$. Therefore, we can obtain positive incentives for no equity or debt issue when $b < 0$, and, when $b > 0$, incentives to issue equity only when $a+bd < 0$, and to issue debt only when $a+bd > 0$. This policy (with optimal investment and the asset prices then implied by rationality of pricing) is supported by the compensation scheme

$$s(a+bd,d,F,P_1,P_2,B_1,B_2) = \alpha + \beta(a+bd) - d\delta(d,a+bd,F), \qquad (6)$$

where

$$\delta(d,a{+}bd,F) = \begin{cases} 0 & \text{if } a{+}bd < 0 \text{ and } B_1(d,F) = 0 \\ & \text{or if } a{+}bd > 0 \text{ and } B_1(d,F) = 1 \\ -k & \text{otherwise,} \end{cases} \qquad (7)$$

$B_1(\cdot,\cdot)$ is the rational bond price under the stated policy, and the constants are chosen for feasibility (β and k chosen small enough, and α chosen to make the reservation utility constraint an equality).

Dividend Policy

Problem III (in Table 3) deviates from Problem I in giving the informed manager a choice of dividend policy. To keep the notation in some control, we restrict the manager to issuing only equity, although irrelevancy of dividend policy is obviously not dependent on this assumption. Problem III is contained in Table 3.

Table 3: **The Entrepreneur's Choice Problem III**

Choose a compensation scheme $s(a+bd,d,D,P_1,P_2)$, an equilibrium investment decision rule $d^*(a,b)$, equilibrium dividend $D^*(a,b)$, and pricing rules $P_1(d,D)$ (time 1 ex-dividend price), $P_2(d,D,a+bd)$ to maximize the initial offering price $P_0 = E[I^a+\tilde{a}+\tilde{b}d^*(\tilde{a},\tilde{b})-s^*(\tilde{a},\tilde{b})]$ subject to

(1) Manager's equilibrium payoff

$$s^*(a,b) \equiv s(a+bd^*(a,b),d^*(a,b),D^*(a,b),P_1(d^*(a,b),D^*(a,b)),$$
$$P_2(d^*(a,b),D^*(a,b),a+bd^*(a,b)))$$

(2) Rationality of prices

(a) $P_1(d,D) = E[I^a+I^bd+\tilde{a}+\tilde{b}d-s^*(\tilde{a},\tilde{b})\,|\,d^*(a,b)=d \text{ and } D^*(a,b)=D]$

(b) $$P_2(d,D,a+bd) = \frac{P_1(d,D)}{P_1(d,D)+I^bd+D}[I^a+I^bd+(a+bd)$$
$$-s(a+bd,d,D,P_1(d,D),P_2(d,a+db,D))]$$

(3) Incentive compatibility of the investment decision

The decision rule $d^*(a,b)$ and choice of dividend $D^*(a,b)$ solve the manager's problem

Choose $d(a,b)$ and $D(a,b)$ to

$$\max E[s(\tilde{a}+\tilde{b}d(\tilde{a},\tilde{b}),d(\tilde{a},\tilde{b}),D(\tilde{a},\tilde{b}),P_1(d(\tilde{a},\tilde{b}),,D(\tilde{a},\tilde{b})),$$
$$P_2(d(\tilde{a},\tilde{b}),\tilde{a}+\tilde{b}d(\tilde{a},\tilde{b}),D(\tilde{a},\tilde{b}))]$$

s.t. $(\forall a,b)\ d(a,b) = 0 \text{ or } 1$,

$(\forall a,b)\ D(a,b) \geq 0$, and

$(\forall a,b)\ s(a+bd,d,D,P_1,P_2) \geq 0.$

(4) Manager's reservation utility constraint: $E[s^*(\tilde{a},\tilde{b})] \geq U^*$.

(5) Positive equity at the end of period 1: $(\forall a,b)\ P_1(d,D) > 0$.

The sharing rule given in equation (2), optimal investment, and any dividend strategy will solve Problem 3 and leave the manager indifferent about dividend strategy. As before, there is a market-value-based alternative to the compensation schedule given in equation (2), which is

$$s(a+bd,d,D,P_1,P_2) = \gamma + \delta \left[P_2 + (I^b d + D)\,\frac{(P_2 - P_1)}{P_1} + D\right] \tag{8}$$

and can be interpreted as follows. As before, the manager is paid a constant plus a term proportional to the portfolio of the initial stock plus a *pro rata* purchase and participation in all new issues. The difference is that the manager also receives a *pro rata* share of the dividends distributed by the firm. In this way, not only is the manager protected from any capital gain or loss on new shares issued but it is also the case that the manager's shadow shares are protected against the dividend. Equivalence of (8) is to (2) can be seen by substituting the rationality of pricing constraint for P_2 (from Problem III) into (8) and solving for $s()$. The result is that $\alpha = (\gamma + \delta I^a)/(1 + \delta)$ and $\beta = \delta/(1 + \delta)$ which verifies that the incentives provided by the two contracts are the same. Again, share price does not reflect the private information of the manager but does rationally reflect the public information.

It is interesting to relate our model to that of Miller and Rock (1984). Miller and Rock's "social welfare" sharing rule gives the manager an interest in the time *1* and the time *2* price of shares. This translates into a compensation schedule $\alpha + \beta(kP_1 + (1-k)P_2)$ in our model. Under this schedule, the manager has an interest in manipulating the market price at time *1* and consequently dividends contain information about firm value.

This interest the manager has in the market price at time *1* causes the inefficient investment policy found by Miller and Rock. Miller and Rock recognize that the incentives they assume for the firm drive this result but they are concerned with the different issue of the time inconsistency of the optimal policy. Under the optimal compensation schedule, there arises neither inefficient investment nor time inconsistency.

Separation of Incentives and Financing

In previous subsections, we have studied models in which optimal investment is obtained. This feature is special to the Myers and Majluf framework we are considering, for example, because there is no costly effort on the part of the manager. If there were costly effort on the part of the manager, we would have the traditional trade-off between incentives and risk-sharing that occurs in all significant agency problems. This trade-off would imply a second-best solution in which there is suboptimal investment. Nonetheless, financing would not matter in the sense that the degree of suboptimality of investment does not depend on financing. The reason is that the "real" set of feasible contracts to the manager does not depend on financing.

To obtain the general result, we assume there are no taxes or transaction costs (to avoid the traditional violations of Modigliani-Miller), and an additional assumption. Namely, the information available to the public (and potentially revealed through the stock price) is a function of information known by the manager and those evaluating the manager. (Or, more generally, we could assume that the public information is not marginally useful to the manager for making investment decisions or to the people evaluating the manager, given their information sets.) In the absence of this assumption, capital structure may influence the usefulness of the information revealed through prices. Once this assumption is satisfied, separation of incentives and financing is valid quite generally. The proof uses composition of functions just like the proof of the existence of a direct mechanism in revealed preference theory.

Here is the idea behind the proof. Suppose a manager's compensation depends on market prices, the manager's actions, information that is publicly available (at some date), and fundamentals within the firm. We know that market prices depend only on the publicly available information in a known way. Therefore, we can "see through" the dependence of the compensation on market price, understanding that this is just an alternative route of introducing dependence on the publicly available information. And, the manager's real actions can be retained and the actions about financing can be changed to announcements. Once we realize this, we can rewrite the compensation directly as a function of publicly available information, the manager's actions and announcements, and fundamentals within the firm. But, this form of the compensation schedule is now completely independent of the form of the financial structure of the firm. Therefore, any investment policy (and consequently any market value) that is feasible under one financial policy is also feasible under all other financial policies.

Problem IV (Table 4) presents a choice problem for the entrepreneur which includes a value to the firm of the manager expending personally costly "effort".

Table 4: **The Entrepreneur's Choice Problem IV**

Choose a compensation scheme $s(a+bd,d,\theta,P_1,P_2)$, an equilibrium investment decision rule $d^*(\eta,\theta)$, equilibrium "effort" levels $x^*(\eta,\theta)$, and pricing rules $P_1(d,\theta)$, $P_2(d,\theta,a+bd)$, where η is a private signal observed by the manager at time 1 and θ is a public signal observed by all agents at time 1, to maximize the initial offering price

$P_0 = E[I^a+\tilde{a}^*+\tilde{b}^*d^*(\tilde{\eta},\tilde{\theta})-s^*(\tilde{\eta},\tilde{\theta})]$ subject to

(1) Manager's equilibrium payoff

$$s^*(\eta,\theta) \equiv s(a^*+b^*d^*(\eta,\theta),d^*(\eta,\theta),\theta,P_1(d^*(\eta,\theta),\theta),$$
$$P_2(d^*(\eta,\theta),\theta,a^*+b^*d^*(\eta,\theta)))$$

(2) Equilibrium Project Value Functions

$$a^* \equiv a(x^*(\eta,\theta),\eta,\theta) \text{ and } b^* \equiv b(x^*(\eta,\theta),\eta,\theta)$$

(3) Rationality of prices

(a) $P_1(d,\theta) = E[I^a+\tilde{a}^*+\tilde{b}^*d-s^*(\tilde{\eta},\tilde{\theta})\,|\,\theta,\ d^*(\eta,\theta) = d]$

(b) $$P_2(d,\theta,a+bd) = \frac{P_1(d,\theta)}{P_1(d,\theta)+I^bd}\Big[I^a+I^bd+(a+bd)$$
$$-s(a+bd,d,\theta,P_1(d,\theta),P_2(d,\theta,a+db)\Big\}\Big|$$

(4) Incentive compatibility of the investment decision

The decision rule $d^*(\eta,\theta)$ and the effort level $x^*(\eta,\theta)$ solve the manager's problem

Choose $d(\eta,\theta)$ and $x(\eta,\theta)$ to

$$\max E(U[s(\tilde{a}+\tilde{b}d(\tilde{\eta},\tilde{\theta}),d(\tilde{\eta},\tilde{\theta}),P_1(d(\tilde{\eta},\tilde{\theta}),\tilde{\theta}),$$
$$P_2(d(\tilde{\eta},\tilde{\theta}),\tilde{\theta},\tilde{a}+\tilde{b}d(\tilde{\eta},\tilde{\theta}))),\ x(\tilde{\eta},\tilde{\theta})])$$

s.t. $(\forall\eta,\theta,x)$ $d(\eta,\theta) = 0$ or 1, $a = a(x,\eta,\theta)$, $b = b(x,\eta,\theta)$, and

$$s(a+bd(\eta,\theta),d(\eta,\theta),P_1(d(\eta,\theta),\theta),P_2(d(\eta,\theta),\theta,a+bd(\eta,\theta))) \geq 0,$$

$$(\forall\eta,\theta)\ x(\eta,\theta) \geq 0.$$

(5) Manager's reservation utility constraint

$$E(U[s^*(\tilde{\eta},\tilde{\theta}),x^*(\tilde{\eta},\tilde{\theta})]) \geq U^*.$$

Problem IV is a variation of Problem I, the differences being the following. Now, in addition to the investment decision that the manager must make on behalf of the shareholders, the manager must also choose a level of effort. The manager's effort is assumed to increase the profitability of the projects *a* and *b*. The effectiveness of effort is allowed to depend upon the state of nature. The problem includes a public signal θ observed by all agents in the economy at time *1*, and a private signal η observed only by the manager. These signals are interpreted as indicators of the realized state of nature (i.e., they contain information on the productivity of effort). In this problem the manager chooses an investment policy $d(\eta,\theta)$ and effort level $x(\eta,\theta)$ in order to maximize his expected utility. We write the manager's utility generally as $U(s(),x())$, and interpret $U()$ as increasing in $s()$ and decreasing in $x()$.

Demonstration of the irrelevance of the firm's capital structure in this problem follows the argument given above. The optimal sharing rule in this case can be written contingent upon any of the publicly observable variables. This naturally includes the time *1* and time *2* market price of the shares. However because the share price depends only upon information that is separately available, any contract can be written dependent only upon public information other than the prices. In this case, any action that can be implemented using a contract of the form $s(a+bd,d,\theta,P_1,P_2)$, can be implemented with a contract of the form $s(a+bd,d,\theta)$. The manager's decisions, and so the value of the firm can therefore be made independent of the capital structure of the firm.

Note that in this problem efficient or "first best" investment is not, in general, achieved. The usual agency model tradeoffs between incentives and risk sharing imply that the manager will not, at the entrepreneur's optimum, expend a first best level of effort. New projects $b(x,\eta,\theta)$ which would be profitable under the first best rule x^* will not be undertaken in this world. With an endogenous investment policy and asymmetric information, we can therefore, demonstrate that the M–M irrelevance propositions hold with or without optimal investment.

3. Reaction of Stock Prices to New Issues: Theory and Empirics

In this section we demonstrate, through the use of a simple numerical example, that the existing empirical evidence is consistent with the model presented here. The existing evidence on stock price reaction to issues of new securities can be summarized as follows.[†] New security issues, in general, seem to be interpreted by the market as bad news. The stock price of firms seeking new financing appears to drop at the announcement date of the new issues. The size (and statistical significance) of this drop is related to the type of security offered. New offerings of equity appear to be particularly bad news, while new issues of debt have a smaller (and a statistically insignificant) negative impact on the stock price of the issuing firm.

Our example shows that the observed price reactions are consistent with optimal investment. The idea behind the example is that in very good states, the existing project generates the funds needed to undertake any new project, and therefore the fact that a firm requires new financing is bad news. In order to stay within the outline of our model, our example

[†] See for example Asquith and Mullins (1986), Dann (1981), Dann and Mikkelson (1984), Eckbo (1986), Masulis and Korwar (1986), and Mikkelson and Partch (1986).

presents this situation as though, in very good states, there is no new project worth undertaking. The result of this presentation is the same, it simply allows us to present the result without modifying our model to allow for interim cash flows generated by the investments.

The example is the following. We assume there are three realizations to the value of the asset in place (project a) and the new project (b). The three equally probable realizations of a and b are given by

$$
\begin{aligned}
a_1 &= 1000 \qquad & b_1 &= -100 \\
a_2 &= 100 \qquad & b_2 &= 100 \\
a_3 &= 100 \qquad & b_3 &= 300
\end{aligned}
$$

Recall that in our model, at time 1 the manager is assumed to observe the realizations a and b. This is equivalent to observing which state of nature is realized in this example. The ex-ante expectations of these random variables are, $\bar{a} = 400$ and $\bar{b} = 100$. We assume that the manager is given a compensation scheme that is similar to that given in equations (6) and (7) above. Specifically $s()$ is given by

$$s(a+bd,d,F,P_1,P_2,B_1,B_2) = \alpha + \beta(a+bd) - d\delta(d,a+bd,F),$$

where

$$
\delta(d,a+bd,F) = \begin{cases} 0 & \text{if } a+bd = 200 \text{ and } B_1(d,F) = 0 \\ & \text{or if } a+bd = 400 \text{ and } B_1(d,F) = b_1 \\ -k & \text{otherwise.} \end{cases}
$$

This contract gives the manager incentives to invest only in profitable new projects and to issue debt in state 3 and equity in state 2. We can interpret this as a financing strategy that aims to stabilize the debt/equity ratio of the firm.

Under the optimal investment policy, $d = 1$ if $b > 0$ and $d = 0$ otherwise, $E[a+bd] = 533.33$. We can therefore write the time 0 price of the original equity offering as $P_0 = I^a + 533.33$, where we have ignored the manager's compensation which we think of as being negligible compared to the size of the firm. Now, consider the market price reaction to issues of new securities. Under this contract if the market, at time 1, observes a new issue being made by the firm the market expects that either state 2 or 3 has been realized. The new issue is bad news. If debt is offered by the firm at time 1, the market expects that state 3 has been realized and the time 1 price of the original equity offering becomes $P_1^D = I^a + 400$. If equity is offered by the firm at time 1 the market price of the original equity becomes $P_1^E = I^a + 200$. On the other hand if no new financing is sought by the firm at time 1 the market price of the shares is given by $P_1^n = I^a + 1000$.

We have shown that the existing empirical evidence on the price impact of new issues of securities is consistent with optimal investment. Issues of new securities are perceived by the market as bad news. New issues of equity are considered to be signals of very bad news, while issues of debt are considered to be news which is only slightly bad. Therefore, even though the evidence is roughly consistent with the story Myers and Majluf tell, this is not convincing proof that their story is correct. This same empirical evidence can be consistent with an optimal (endogenous) investment policy in a world with asymmetric information in which the Modigliani-Miller irrelevancy propositions hold.

4. Timing and the Value of Idiosyncratic Information

It makes sense to think of the "superior" information possessed by a firm's insiders as being composed entirely of firm-specific idiosyncratic information. This assumption is already implicit in the existing signalling literature (and the earlier parts of this paper), as can be seen by noting that pricing in these models is unchanged by the released information. Prices change to incorporate the new information, but the pricing rule remains unaltered. Another common assumption, which we will argue is not justified, is that investors wish to have the information possessed by the firm's insiders communicated to the market, and that they are willing to pay the costs associated with this signal. As shown previously by Ross (1985),[†] we will demonstrate that the timing of release of idiosyncratic information is a matter of indifference to investors in the firm. This follows because the information is diversifiable. Rational investors therefore will not pay more for a firm with earlier information release, and therefore entrepreneurs have an incentive to set up firms in a way that maximizes productive efficiency, without regard to the information release.

For simplicity, and to maintain as close a parallel with earlier sections as possible, we will consider a three date (two period) model, with dates *0*, *1*, and *2*. The absence of arbitrage implies the existence of a positive linear pricing rule that can be used to value assets.[‡] We will write the linear pricing rule using the state price density.[*] Using the

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[†]Ross (1985) was posed more explicitly in an investments context. What is new about our result is the application, not the formal result.

[‡]See Ross (1978) or the recent survey by Dybvig and Ross (1987).

[*]See Dybvig (1988a and 1988b).

linear operator we can write the time *0* and time *1* prices (P_0 and P_1 respectively) of an asset which pays an uncertain amount (denoted $\tilde{P}_2$) at time *2* as

$$P_0 = E_0\left[\tilde{P}_2 \frac{\tilde{\rho}_2}{\rho_0} \right] \tag{1}$$

and

$$P_1 = E_1\left[\tilde{P}_2 \frac{\tilde{\rho}_2}{\rho_1} \right] , \tag{2}$$

A third relationship we will use is the time *0* price of an uncertain amount to be received at time *1*.

$$P_0 = E_0\left[\tilde{P}_1 \frac{\tilde{\rho}_1}{\rho_0} \right] , \tag{3}$$

where E_t represents the time t expectation operator and ρ_t/ρ_τ is the state price density. The state price density can be further defined by noting that if $\tilde{P}_t$ is a riskless payoff of \$1 its price at time τ must equal

$$P_\tau = E_\tau\left[\tilde{P}_t \frac{\tilde{\rho}_t}{\rho_\tau} \right] = E_\tau\left[\frac{\tilde{\rho}_t}{\rho_\tau} \right] = e^{-r(t-\tau)} ,$$

for $t > \tau$ (for simplicity we will make the easily generalizable assumption that the riskless rate is constant).

Proposition: The timing of the release of idiosyncratic information to the market is a matter of indifference to investors.

Proof: To prove our proposition that the timing of the release of idiosyncratic information has no value in and of itself we will examine the time *0* price of an asset with payoff

$$\tilde{P}_2 = \tilde{P} + \tilde{\varepsilon} \; .$$

The random variable $\tilde{\varepsilon}$ is an idiosyncratic noise term. Specifically we require that $\tilde{\varepsilon}$ be a mean zero random variable,

$$E(\tilde{\varepsilon}) = 0 \; ,$$

that is uncorrelated with the state price density,

$$E\left[\tilde{\varepsilon} \, \frac{\tilde{\rho}_t}{\rho_{t-1}} \right] = 0 \; .$$

This second condition is a natural requirement for any idiosyncratic term. If $\tilde{\varepsilon}$ is correlated with the state price density then the realization of $\tilde{\varepsilon}$ will alter pricing throughout the entire market. In other words, using $\tilde{Q}$ to represent an arbitrary payoff stream which may be independent of $\tilde{\varepsilon}$, in general

$$E\left[\tilde{Q} \, \frac{\tilde{\rho}_t}{\rho_{t-1}} \right] \neq E\left[\tilde{Q} \, \frac{\tilde{\rho}_t}{\rho_{t-1}} \,\middle|\, \varepsilon \right]$$

if

$$E\left[\tilde{\varepsilon}\,\frac{\tilde{\rho}_t}{\rho_{t-1}}\right] \neq 0 .$$

If the realization of $\tilde{\varepsilon}$ is not known until time *2*, the time *1* price of an asset with time *2* payoff $\tilde{P}_2$ (as given above) is

$$P_1' = E_1\left[(\tilde{P} + \tilde{\varepsilon})\,\frac{\tilde{\rho}_2}{\rho_1}\right]$$

$$= E_1\left[\tilde{P}\,\frac{\tilde{\rho}_2}{\rho_1}\right] + E_1\left[\tilde{\varepsilon}\,\frac{\tilde{\rho}_2}{\rho_1}\right]$$

$$= E_1\left[\bar{P}\,\frac{\tilde{\rho}_2}{\rho_1}\right] .$$

Using the law of iterated expectations and substituting the expression for P'_1 into the relation (3), we obtain the time *0* price

$$P_0' = E_0\left[\tilde{P}_1'\,\frac{\tilde{\rho}_1}{\rho_0}\right]$$

$$= E_0\left[E_1\left[\tilde{P}\,\frac{\tilde{\rho}_2}{\rho_1}\right]\frac{\tilde{\rho}_1}{\rho_0}\right]$$

$$= E_0\left[\tilde{P}\,\frac{\tilde{\rho}_2}{\rho_0}\right] ,$$

of the asset when the uncertainty concerning $\tilde{\varepsilon}$ is resolved at time *2*.

If the realization of $\tilde{\varepsilon}$ is known at time *1*, we can similarly derive P_1 and P_0, the time *1* and time *0* price of this "new" asset. The time *1* price is

$$P_1 = E_1\left[(\tilde{P} + \varepsilon) \frac{\tilde{\rho}_2}{\rho_1} \right]$$

$$= E_1\left[\tilde{P} \frac{\tilde{\rho}_2}{\rho_1} \right] + \varepsilon E_1\left[\frac{\tilde{\rho}_2}{\rho_1} \right]$$

$$= E_1\left[\tilde{P} \frac{\tilde{\rho}_2}{\rho_1} \right] + \varepsilon e^{-r} .$$

The time *0* price of this second asset is given by

$$P_0 = E_0\left[\tilde{P}_1 \frac{\tilde{\rho}_1}{\rho_0} \right]$$

$$= E_0\left[\left(E_1\left[\tilde{P} \frac{\tilde{\rho}_2}{\rho_1} \right] + \tilde{\varepsilon} e^{-r} \right) \frac{\tilde{\rho}_1}{\rho_0} \right]$$

$$= E_0\left[E_1\left[\tilde{P} \frac{\tilde{\rho}_2}{\rho_1} \right] \frac{\tilde{\rho}_1}{\rho_0} \right] + e^{-r} E_0\left[\tilde{\varepsilon} \frac{\tilde{\rho}_1}{\rho_0} \right]$$

$$= E_0\left[\tilde{P} \frac{\tilde{\rho}_2}{\rho_0} \right]$$

$$= P_0' ,$$

which proves our proposition. ■

We can derive this result in terms of asset returns as follows. Consider three assets which exist in a market. A "standard" asset with prices given by P_0^*, P_1^*, and P_2^*, which provides gross returns of $R_1^* = P_1^*/P_0^*$, $R_2^* = P_2^*/P_1^*$, and a two period return of $R^* = P_2^*/P_0^*$. Asset two has the same payoff as the standard asset with an added mean zero idiosyncratic noise term ($\tilde{\varepsilon}^2$) that is uncorrelated with the prices P_1^* and P_2^*. The realization of $\tilde{\varepsilon}^2$ is known at time *1* but payoffs on the assets are not received until time *2*. Asset three has the same payoff as asset two except that the realization of the random variable $\tilde{\varepsilon}^3$ is not known until time *2*.

Asset two has prices given by,

$$P_0^2 = P_0^* \ ,$$

$$P_1^2 = P_1^* + \varepsilon^2 e^{-r_1} \ ,$$

and

$$P_2^2 = P_2^* + \varepsilon^2 \ .$$

And returns given by

$$R_1^2 = \frac{P_1^2}{P_0^2} = \frac{P_1^*}{P_0^*} + \frac{\varepsilon^2 e^{-r_1}}{P_0^*} = R_1^* + \frac{\varepsilon^2 e^{-r_1}}{P_0^*} \ ,$$

and

$$R_2^2 = \frac{P_2^2}{P_1^2} = \frac{P_2^*}{P_1^2} + \frac{\varepsilon^2}{P_1^2} = \frac{P_2^*}{P_1^* + \varepsilon^2 e^{-r_1}} + \frac{\varepsilon^2}{P_1^* + \varepsilon^2 e^{-r_1}}$$

$$= \alpha R_2^* + (1-\alpha)\, e^{r_1} \quad ,$$

where

$$\alpha = \frac{R_1^*}{R_1^* + \dfrac{\varepsilon^2 e^{-r_1}}{P_0^*}} \quad .$$

The two period return on asset two is given by

$$R^2 = \frac{P_2^2}{P_0^2} = \frac{P_2^*}{P_0^*} + \frac{\varepsilon^2}{P_0^*} = R^* + \frac{\varepsilon^2}{P_0^*} \quad .$$

Asset three has prices given by

$$P_0^3 = P_0^* \ ,$$

$$P_1^3 = P_1^* \ ,$$

and

$$P_2^3 = P_2^* + \varepsilon^3 \quad .$$

The returns for asset three are

$$R_1^3 = \frac{P_1^3}{P_0^3} = \frac{P_1^*}{P_0^*} = R_1^* \; ,$$

$$R_2^3 = \frac{P_2^3}{P_1^3} = \frac{P_2^*}{P_1^*} + \frac{\varepsilon^3}{P_1^*} = R_2^* + \frac{\varepsilon^3}{P_1^*} \; ,$$

and

$$R^3 = \frac{P_2^3}{P_0^3} = \frac{P_2^*}{P_0^*} + \frac{\varepsilon^3}{P_0^*} = R^* + \frac{\varepsilon^3}{P_0^*} \; .$$

Now consider the time *0* expected return for period one (from time *0* to time *1*) and the expected two period (from time *0* to time *2*) return for the three assets. Clearly

$$E_0[R_1^2] = E_0[R_1^3] = E_0[R_1^*]$$

and

$$E_0[R^2] = E_0[R^3] = E_0[R^*] \; ,$$

the expected return on each of the three assets is the same. This result shows that the early resolution of the idiosyncratic uncertainty (embodied in asset two) provides no added value (the market will not accept a smaller expected return for this asset) to investors over later resolution of the uncertainty (asset three). Notice that the time *0* expected return for period two (time *1* to time *2*) is not, in general, the same for assets two and three. This simply reflects the known difference in the flow of information for the two assets and is the equivalent of the difference in P_1 and P_1' in the linear pricing operator analysis given above.

5. Conclusions

In this paper we have shown that the Modigliani-Miller irrelevance propositions hold for a large class of models with asymmetric information and endogenous investment or dividend policies. This result is achieved by assuming that the managerial compensation is chosen in a way that maximizes the value the entrepreneur receives for the firm. A large number of dissipative signaling models have been developed recently which are driven by a suboptimal contract that is imposed by fiat. Using a version of the Myers-Majluf model extended to include the choice over the management contract we show how restrictive is this common assumption. Considering the richness of the set of possible (or even the existing) incentive contracts, it seems misleading to base results on such a costly and clearly suboptimal contract. Even when imperfections, internal to the firm, preclude optimal investment, there is a separation between incentives and financing that allows the M-M propositions to hold. The agency literature points out forcefully and clearly that, in moral hazard situations, (of which the shareholder-manager relationship with asymmetric information is an example), the incentive contract is of primary importance. The recent dissipative signalling models have examined a moral hazard problem while ignoring entirely the issue of the optimality of the contract.

Using an argument advanced in Ross (1985), we demonstrate that the early release of the manager's idiosyncratic information is of no value to investors. Therefore the assumption, implicit in these models, that investors are willing to face the cost of having the manager signal his information to the market is called into question as well.

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