

1 THE DETERMINANTS OF CORPORATE LEVERAGE AND DIVIDEND POLICIES

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There exist different theories

Only taxes are important : corporate and personal income taxes are the only factors that systematically affect capital structure and dividend policies - and even that effect may be small.

Static Tradeoff Theory : corporate financing choices reflect an attempt by managers to balance the tax shields of greater leverage against the increased probability and costs of financial distress (known as "bankruptcy costs").

In cases where such costs are low, high leverage and dividends can even have important benefits in controlling a natural corporate tendency to overinvest (called the "free cash flow" problem).

Pecking Order Theory : financing and dividend decisions are concerned primarily with "signalling" effects of such decisions. Examples: the tendency of stock prices to fall significantly in response to dividend cuts and common stock offerings.

The actual corporate structures are the cumulative result of a series of individual decisions in which managers follow a pecking order.

Competing theories subject to empirical testing : 6780 companies over the 1963-1993 period; 84 689 observations ($6780 \times 30 = 203\ 400$ observations and $84\ 689 / 203\ 400 = 41.6\%$).

1.1 Some historical evidence

	Mean	Standard Deviation	25 th Percentile	Median	75 th percentile
Leverage	25 %	18 %	10 %	23 %	37 %
Dividend yield	2.4 %	3.4 %	0 %	1 %	3.9 %

Table I, p.5 : Both market leverage ratios and dividends yields appear to be remarkably stable, even if volatility in 1973-1975.

1.2 The M&M irrelevance propositions

Neither a company's financing policy nor its dividend policy should be expected to affect its market value.

That value is determined solely by managerial decisions affecting the left-hand side of the balance sheet - the investment policy.

Set of restrictive conditions:

- no corporate or personal taxes
- no contracting costs : reorganization costs
- corporate investment policy is **fixed**. Investment decisions are not influenced by financing or dividend choices
- no information costs, no informational asymmetries

Analogy with the pizza: «no information cost means that everyone sees the same pizza; no taxes means the IRS gets none of the pie; and no contracting costs means nothing sticks to the knife.»

Practical value of MM irrelevance propositions : if the assumptions of their model are relaxed, the financing and dividend decisions

- affect taxes paid by issuers or investors
- affect the probability - and associated costs - of getting into financial difficulty
- affect management incentives to follow the value-maximizing rule in investing in all positive NPV projects and perhaps rejecting all others
- they provide a credible signal to investors of management's confidence (or lack thereof) about the firm's future earnings.

1.3 Taxes

1.3.1 Taxes and Capital Structure

MM, 1961 (no taxes) : $V_E = V_{NE} = \text{EBIT}/k_{NE}$

MM, 1963 (corporate tax rate only) : $V_E = V_{NE} + t_c B = \text{EBIT}(1-t_c)/k_{NE} + t_c B$

Miller, 1977 (corporate tax rate plus personal tax rates)

$$V_E = V_{NE} + B \left[1 - \frac{(1-t_c)(1-t_s)}{1-t_b} \right] = V_{NE} + BG$$

Where s: shares (dividends and capital gains); b : bonds

If $t_s > t_b$, then $t_c < G$

If $t_s < t_b$, then $t_c > G$

If $t_s = t_b$, then $t_c = G$

Ex: dividend = 100, $t_m = 40\%$, $t_c = 30\%$

Gross up of dividend = $100\$ * 1.25 = 125\$$

Tax = $40\% * 125\$ - 25\$ = 25\$$

Tax/Dividend = $25 / 100 = 25\%$

$t_{div} = (5/4) * t_m - 1/4 < t_m$ and $t_{div} = 1.25 * 40\% - 25\% = 25\%$;

$t_{int} = t_m$

$t_{div} = 25\% < t_{int} = t_m = 40\%$

$G = 1 - [(1 - t_c)(1 - t_s)/(1 - t_b)] = 1 - [(1 - 30\%)(1 - 25\%)/(1 - 40\%)] = 1 - 87.5\% = \underline{12.5\%} < t_c$

⇒ Compensation for these increased taxes in the form of higher yields on corporate debt.
The firm bears the tax consequences directly (corporate income tax) and indirectly (higher required rates of return on securities it sells)

There exist other tax shields: Investment tax credit, tax loss carryforwards (if tax deductions exceed taxable revenues: operating losses; tax losses = deferred tax assets, for their realization depends on future taxable income; can be carried forward)

Companies with more investment tax credit and tax loss carryforwards should have lower leverage (opportunity cost).

Example: 2 identical companies with 400\$ of tax credit or tax loss carryforwards, however the former has zero debt and the latter has debt (500\$ = interest payment).

= Earnings before interest and taxes (EBIT)	1000	1000
- Interest	- 0	- 500
= Earnings after interest and before taxes (EAIBT) = EBIT - $k_D * D$	= 1000	= 500
- $t * EAIBT$ (t = 40%)	- 400	- 200
+Tax Credit or Tax CF	+ 400	+ 200
= NI = (EBIT- $k_D * D$)- ($t * EAIBT$ -Tax L C)	= 0	= 0

The second firm has not used 200\$ of tax loss carryforward and can lose it.

1.3.2 Taxes and Dividend Policy

- Dividends are taxed at the personal level
- Undistributed profits that result in capital gains are not taxed at the personal level until the shares are sold and the capital gains realized

Consequence: increasing the tax liabilities of individual investors increases the required rate of return on the firm's equity

All firms have access to the same pool of investors and so face the same potential tax penalty

Therefore, we would expect differences in dividend policy - at least for large, publicly traded companies - to be driven by factors other than taxes

1.4 Bankruptcy costs and corporate investment policy

The optimal capital structure is the one where the next dollar of debt is expected to provide an incremental tax subsidy that just offsets the resulting increase in expected bankruptcy costs

1.4.1 Direct Bankruptcy Costs

Small relative to market values of the companies. Higher for small companies, but too low to be an important factor in corporate financing decisions

1.4.2 Indirect Bankruptcy Costs

Reduction in firm value, for in financial difficulty, financing and dividend decisions affect investment policy.

If bankruptcy, veto on risk shift (riskier projects) : interests of the court-appointed judge or trustee in bankruptcy do not line up with shareholders' interests.

If financial difficulties, highly leveraged companies are more likely than their low-debt counterparts to pass up valuable investment opportunities (shortsighted cutbacks in R&D, maintenance, advertising, or training that end up reducing the value of the firm).

Why ? In high-growth technology firms, if sales do not materialize

- ▶ Creditors can write down the value of their loans. But reluctant to do this !
- ▶ New shareholders: infusion of new equity will go toward shoring up the creditors' position \Rightarrow lower stock price and excessive dilution of ownership !

\Rightarrow Underinvestment problem

Underinvestment problem

"Growth options" companies as opposed to "assets in place" companies are likely to find debt financing very costly.

"Growth options" companies : lack of collateral \Rightarrow debt very difficult and expensive to obtain.

"Assets in place" companies : more collateral, indirect costs of financial distress (or even bankruptcy) are likely to prove quite low \Rightarrow higher leverage ratios.

Rating agencies: leveraged ratios are expressed in terms of book values rather than in market values for book values reflect tangible assets, i.e. better collateral for lenders.

1.5 The benefits of debt in controlling corporate overinvestment

Free Cash Flow problem: inclination of many corporate managers to use FCF to sustain growth at the expense of profitability, either through misguided efforts to gain market share in mature businesses or - perhaps worse - through diversifying acquisitions \Rightarrow 2 ways of distributing excess capital.

1.5.1 Disciplinary role of debt

Substitutions of debt for equity: leveraged stock repurchases.

Contractually obligated payments of interest and principal are more effective than discretionary dividend payments in squeezing out excess capital.

Debt financing can have a beneficial effect by causing managers otherwise inclined to overinvest to be more critical in evaluating spending plans.

Reduction of the agency costs of equity (separation of ownership from control in large public companies). In "growth options" firms, risk-sharing benefits outweigh these agency costs. In "Assets in place" companies, debt allows the concentration of ownership \Rightarrow more effective monitoring of corporate managers by active investors.

1.5.2 Disciplinary role of dividends

Paying higher dividends is one way of distributing excess capital.

In "Assets in place" companies, potential overinvestment problem \Rightarrow higher dividends

In "growth options" firms, potential overinvestment problem, higher flotation costs of new securities, particularly equity \Rightarrow lower dividends

Table 2, p. 10 : Investment opportunities, contracting costs, and leverage and dividend choices

Investment Opportunity Spectrum		
	Assets in place	Growth options
Cost of debt (Underinvestment)	Low	High
Benefits of debt (\downarrow FCF : Solution to the overinvestment problem)	High	Low
<i>Predicted leverage</i>	<i>High</i>	<i>Low</i>
Costs of dividends (flotation costs)	Low	High
Benefits of dividends (\downarrow FCF)	High	Low
<i>Predicted Dividend Yield</i>	<i>High</i>	<i>Low</i>

1.6 Information costs and signaling effects

There exists asymmetric information: insider trading, market reactions to major corporate decisions' announcements

Managers need a credible mechanism to signal their information to the market.

Credible means the costs of communicating falsely are large enough to induce managers to reveal the truth \Rightarrow capital structure or dividend policy.

1.6.1 Signaling and Capital Structure

Adding more debt to the firm's capital structure can serve as a credible signal of high future cash flows.

Differences between debt and equity

- ▶ By committing the firm to make future interest payments to bondholders, managers communicate their confidence that the firm will have sufficient cash flows to meet these obligations (see disciplinary role of debt).
- ▶ Debt claims are less sensitive than equity claims to changes in firm value. If undervalued, the firm will prefer to issue debt (less undervalued security); if overvalued, the firm will prefer to issue equity (most overvalued security).

Predictions : companies that feel they are undervalued (high-quality firms) should use more debt in their capital structures than overvalued firms (low-quality firms).

Consistently with this thinking:

Announcements of leverage-increasing transactions

In reaction to large debt-for-stock exchanges, stock prices go up by 14% on average

In reaction to debt-for-preferred exchanges and preferred-for-common exchanges, prices move up by 2.2% and 8.3% respectively.

Announcements of leverage-reducing transactions

In reaction to common-for-debt exchanges and preferred-for-debt exchanges, stock prices go down by 9.9% and 7.7% respectively.

Market reaction to new securities offerings is negative in general:

Less negative to new debt offerings (the average response is trivially negative) than to new common stock offerings (down 3%).

1.6.2 A Note on the Pecking Order Theory of Capital Structure

Capital structures reflect the accumulation of their past financing requirements and debt ratios change in response to imbalances between internally-generated cash flows and investment opportunities.

POT : financing of new investments with the cheapest available source of funds

Internally generated funds > outside funding

Debt > Equity

Predictions :

"assets in place" companies with few investment opportunities and substantial FCF will have low debt ratios.

"growth options" companies with investment opportunities and lower operating CF will have high debt ratios.

A set of predictions that are *precisely the opposite* of those offered by contracting cost and tax arguments.

1.6.3 Signaling and Dividend Policy

Capital structure considered a coarse instrument for communicating with the market

More cost-effective signaling mechanism than capital structure

As in the case of capital-structure signaling models, provides little guidance as to what level of payout will prove optimal.

1.7 Evidence on determinants of leverage and dividend policies

Estimation : (6 780 companies over 30 years (1963-1993) \Rightarrow 71 384 observations)

OLS for the determinants of corporate leverage policy

Censored Tobit regressions for the determinants of dividend policy

1) One-step procedure, i.e. a pooled OLS regression (71 384); 2) One-step procedure, i.e. a cross-sectional regression on averages (\neq from two-step and problems with % and \$); 3) Fixed effects regression : a dummy variable for each firm (71 384 - 70 695 = 689 ?)

For the determinants of corporate leverage policy :

R^2 : 27% (pooled OLS regression and cross-sectional regressions) and 18% (Fixed effects regression) \Rightarrow explain both the time-series and cross-sectional variation in corporate leverage decisions.

For the determinants of dividend policy:

R^2 : 23% (pooled OLS regression); 30% (cross-sectional regressions) and 2% (Fixed effects regression) \Rightarrow explain the cross-sectional variation in corporate leverage decisions, but not the changes in yields over time.

1.7.1 Investment Opportunities : ME/BE

First measure : Market-to-book ratio

Predictions :

- ▶ *Underinvestment hypothesis*

High ME/BE should have lower leverage and lower dividend yields

- ▶ *Tax and contracting hypothesis*

Idem, lower ME/BE that face low financial distress and high FCF problems should have higher leverage and higher dividend yields

- ▶ *POT hypothesis*

On the contrary, lower ME/BE should have lower leverage

Result : Strongly negative significant statistical relation and economic relation

Economic relation : implied change in leverage from moving from the bottom decile to the top decile = -14.3% (Test : $-14.3\% / 25.17\% = 56.87\%$; 25.17% stands for the mean).

ME/BE of the bottom decile $\Rightarrow (y_1, 0.77)$ and ME/BE of the top decile = 2.59 $\Rightarrow (y_2, 2.59)$ in (leverage, ME/BE). Estimated slope = -7.85

Slope = $(y_2 - y_1) / (x_2 - x_1)$ and $-7.85 = \Delta y / (2.59 - 0.77) = \Delta y / 1.82 \Rightarrow \Delta y = -14.3\%$

Second measure : Regulation

Regulation reduces the problem of underinvestment by transferring much of the management's discretion over investment decisions to regulatory authorities. Besides, stability of cash flows.

Prediction :

▶ *Underinvestment hypothesis*

Regulated companies should have higher leverage and higher dividend yields than unregulated companies.

Example of the telecommunications industry which was deregulated in 1982

Leverage ratios have fallen from almost 45% prior to 1980 to under 25% after 1985

Dividend yields have fallen from over 5% prior to 1980 to less than 2% after 1985

Results : Dummy variable = increase leverage ratios by 14.66 percentage points and dividend yields by 4.20 percentage points.

1.7.2 Signaling

Definitions:

Martingale or random walk : $E(\text{earnings}_{t+1}) = \text{earnings}_t$

Martingale with drift : $E(\text{earnings}_{t+1}) = \text{earnings}_t + d$

Mean reverting : $E(\text{earnings}_{t+1}) = E(\text{earnings}_t) = \text{average earnings}$

Mean reverting with drift : $E(\text{earnings}_{t+1}) = E(\text{earnings}_t) + d = \text{average earnings} + d$

Measure of low-quality and high-quality firms : current year's earnings - past earnings :

If > 0 (< 0), then a high-quality (low-quality) firm.

If earnings follow a random walk \Rightarrow *problem of growth ? link with profitability ?*

Prediction :

► *Signaling hypothesis*

High-quality (or undervalued) firms should have higher leverage and higher dividend yields than low-quality (or overvalued) firms.

Result : positive and significant relation with leverage and negative and insignificant relation with dividends (inconsistent with the signaling hypothesis). But low economic impact.

1.7.3 Corporate Taxes

Measure : dummy variable for tax-loss carryforwards and investment tax credits

Prediction :

▸ *Tax hypothesis*

Companies with low effective marginal tax rates (large tax loss carryforwards) and high non-interest tax shields (investment tax credits) should have less debt in their capital structure. Negative relation with leverage.

The theory says nothing about dividends and taxes

Results :

Negative for the dummy representing investment tax credits, but marginally significant

Positive and significant for the dummy representing tax loss carryforwards :
«reverse causality» \Rightarrow losses \Rightarrow \downarrow value \Rightarrow \uparrow leverage

\Rightarrow Differences in contracting costs between debt and equity are more important than taxes in explaining corporate leverage ratios

1.7.4 Firm Size

Measure : log of total sales

Prediction :

- ▶ *Bankruptcy hypothesis*

Larger firms should have higher leverage ratios for they have lower direct bankruptcy costs. Positive relation

Dividends ?

Results :

Mixed for leverage ratios

Clearcut for dividend yields : larger firms have higher dividends yields (70 % to 250% higher than the average 2.4%).

1.8 Conclusions

The most important systematic determinant of a company's leverage ratio and dividend yield : the extent of its investment opportunities.

For high-growth firms : underinvestment problem if debt and flotation costs of high dividends make both policies potentially very costly

For mature firms : high leverage and high dividend yields have substantial benefits in controlling the FCF problem.

$R^2 = 30\% \Rightarrow$ regressions explain a third of the differences among companies in leverage and dividend policies.

Limits : debt is not the same; it can differ in several respects : maturity, covenants restrictions, convertibility and call provisions, security, and whether the debt is privately placed or held by widely-dispersed public investors.

Junk bonds + warrants + call provisions for high-growth firms + private: more flexible;
Junk bonds and LBO or MBO : "Assets in place" companies.

Tableau synthèse des résultats de BSW sur l'influence des politiques de financement et de dividendes sur la valeur de la firme

	Dette - théorie	Résultat	Dividendes - théorie	Résultat
ME/BE	-	-	-	-
Réglementation	+	+	+	+
Bénéfices anormaux	+	+	+	- *
Pertes d'impôt reportées	-	+		
Crédits d'impôts	-	- *		
Taille (Ventes)	+ / -	Mixte	+	-

**marginalelement significatif*

ALBOUY ET DUMONTIER

DIVIDENDES

Seule l'amélioration de la capacité bénéficiaire, dont le dividende n'est qu'une manifestation, est à l'origine de la création de valeur.

Pour une structure financière et pour un montant d'investissement donnés, peut-on modifier la valeur de l'entreprise en manipulant les dividendes ?

NON, si émission d'actions pour financer les dividendes, c'est une "opération blanche".

Les conclusions de MM en matière de dividendes et d'endettement sont fortement semblables : si les politiques de financement et de distribution sont susceptibles d'affecter la valeur de l'entreprise, ce n'est qu'à cause de règles fiscales discriminantes.

FINANCE D'ENTREPRISE APRES MILLER

Caractère exclusivement économique. La firme n'est qu'une boîte noire dans laquelle entrent et sortent des flux de fonds. Il faut les répartir entre 2 sortes de bailleurs de fonds: les actionnaires et les créanciers.

Pas de question sur l'influence du mode d'organisation et de contrôle interne (structure de la propriété du capital) de l'entreprise sur le mécanisme de création de richesse.

Pas de conflits d'intérêt entre créanciers et actionnaires, ni entre actionnaires minoritaires et actionnaires majoritaires. Donc, pas de question sur leur mode de résolution

THÉORIE DE L'AGENCE (JENSEN ET MECKLING)

Coûts de contrôle ou de surveillance: coûts engagés par le mandant (principal) pour s'assurer que le mandataire (l'agent) agisse dans le sens de ses intérêts.

Coûts d'obligation ou de dédouanement : coûts engagés par le mandataire (l'agent) pour convaincre le mandant (principal) qu'il agit bien dans son intérêt.

Coûts résiduels : coûts liés au fait que les deux parties vont accepter, dans leur intérêt réciproque, de ne pas aller jusqu'au bout de leur logique. Sinon, coût marginal supérieur au bénéfice marginal.

Lien entre théorie des organisations et la théorie financière. Conflits d'intérêt potentiels et donc se pose la question de la résolution de ces conflits.

Effet disciplinaire de la dette: décisions d'investissement et de financement non indépendantes.

ASYMÉTRIE DE L'INFORMATION

Entre offreurs (investisseurs) et demandeurs (entreprises) de capitaux.

Dividende : plus seulement un flux de fonds, mais un signal envoyé au marché.

Structure financière : La valeur augmente quand la part des actionnaires - dirigeants augmente (Leland et Pyle). La valeur augmente quand endettement supérieur (Ross).

Selon MM, le management financier n'a pas d'impact sur le processus de création de valeur. Pourtant, opérations de prise de contrôle, restructurations financières, rachats d'entreprise avec effets de levier montrent le contraire: effets des changements organisationnels, de la structure de la propriété et du surendettement sur la valeur.

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