

Taxes, Financial Policy, and Investment Incentives

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Two Reasons for Interest in Financial Policy

- Cost-of-capital expression references a cost of funds – but the cost of funds can differ depending on whether it is debt, newly issued equity, or retained earnings
- Tax system may distort corporate financial choices
 - If the tax system encourages debt, is there a social cost of too much bankruptcy risk?
 - Does the tax system encourage firms to repurchase shares rather than pay dividends, and does it matter?
 - Welfare issues at the intersection of public finance and corporate finance have not been deeply studied.
- Role for empirical work:
 - Measure the impact of taxation on corporate borrowing and on distribution policy, both dividend payout and share repurchases
 - Estimate how financial factors such as corporate liquidity, which depends on the average tax rate, affect investment decisions

- Interest is deductible against corporate earnings when defining taxable profits
- Interest income is taxable for households and firms but not for pension funds, endowments
- If investors demand required return ρ , and all investors' interest income tax rate is τ_{int} , then the firm must earn $\frac{\rho}{1-\tau_{\text{int}}}$ to deliver investors' required return
- $f'(K) = \frac{\rho}{1-\tau_{\text{int}}}$ for debt-financed project

Equity Finance: Dividend-Paying Firms

- Corporate earnings net of corporate tax at rate τ_{corp} are available for payment of dividends
- Taxable investors - firms and individuals - are all taxed at rate τ_{DIV} on dividends
- Return to investors when firm earns $f'(K)$ is therefore $(1 - \tau_{\text{DIV}})(1 - \tau_{\text{corp}})f'(K)$
- If investors' required return is ρ , then $f'(K) = \frac{\rho}{(1 - \tau_{\text{DIV}})(1 - \tau_{\text{corp}})}$
- Taxation of earnings at both firm and investor level is sometimes called “double taxation” but the fact that there are two levels of taxation is incidental. The total tax burden, combining firm-level and investor-level, is key.

Equity Finance: Firms That Retain Earnings

- If firms retain earnings, investors derive returns as capital gains on shares rather than dividends
- Corporate tax is similar to that for a dividend-paying firm
- Capital gains are taxed at realization, not accrual, which reduces the effective tax rate
- Some gains escape tax entirely if individual investor holds appreciated assets at death: “basis step up”
- Share repurchases are an alternative to retained earnings, generate capital gains
- Let τ_{cg} denote effective accrual-equivalent tax rate on gains
- Required return on firm projects is now $f'(K) = \frac{\rho}{(1-\tau_{cg})(1-\tau_{corp})}$

Corner Solutions for Corporate Financial Policy

- With fixed required returns and fixed tax rates, hurdle rates are not necessarily the same for projects financed by debt and equity. Firms seeking to make investments should therefore choose the least-taxed way to raise funds.
- If $(1 - \tau_{cg})(1 - \tau_{corp}) > (1 - \tau_{int})$ choose retained earnings finance
- If $(1 - \tau_{cg})(1 - \tau_{corp}) < (1 - \tau_{int})$ choose debt finance
- TCJA (2017) lowered τ_{corp} , and may have changed preferred source of finance by lowering the cost of equity relative to debt
- If corporate tax rates rise in 2021, this may be a good period for studying links between taxes and financing choices

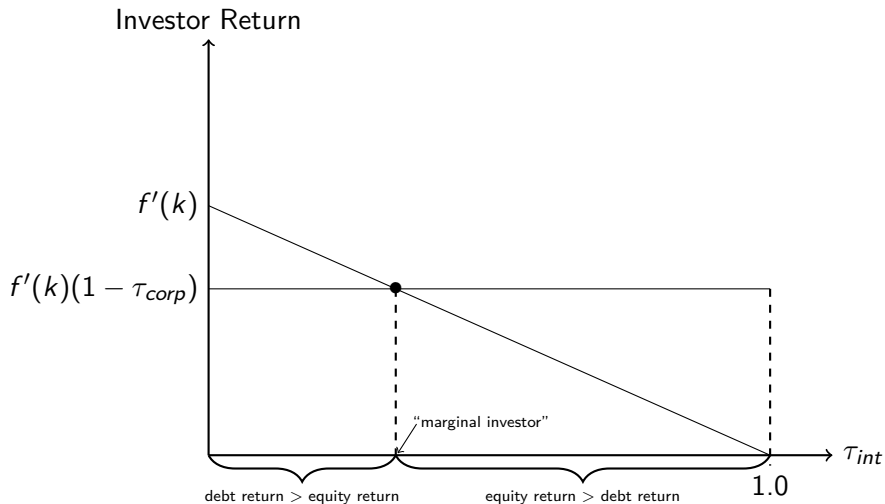
Clientele Models of Financial Policy

- Tax rates are not the same across investors. Rather than assuming that there is a single tax rate, realistic models must incorporate taxpayer heterogeneity.
- Merton Miller (1977 JFin) model, assumes $\tau_{cg} = 0$ and a distribution of interest income tax rates $\{\tau_{int}\}$.
- Return to an investor from an equity-financed corporate project, all returns are capital gains: $f'(k) * (1 - \tau_{corp})$.
- Return to debt-financed project: $f'(k) * (1 - \tau_{int})$.
- Investors segregate into clienteles based on which return is higher: those with $\tau_{int} > \tau_{corp}$ specialize in holding equity, and vice versa.
- For the so-called marginal investor in debt versus equity, $f'(k) * (1 - \tau_{corp}) = f'(k) * (1 - \tau_{int})$. This means that the interest income tax rate of the "marginal investor" is $\tau_{int} = \tau_{corp}$.

Firm Behavior in Clientele Model

- From the firm's perspective, no incentive to issue debt rather than equity because the two have equal net of tax costs
- What determines holdings of debt vs. equity in the aggregate economy? Distribution of taxpayers by marginal tax rates on interest.
- Debt-equity ratio = total wealth of households with $\tau_{corp} > \tau_{int}$ / total wealth of those with $\tau_{corp} > \tau_{int}$.
- What about empirical evidence? Portfolios do not exhibit the strong clientele-style specialization that the Miller suggests.

Miller Model Equilibrium



Explaining Simultaneous Use of Debt and Equity Finance

- Allow required return on debt to change as debt/capital ratio changes
- Assume that investors demand:

ρ_{eq} = required return on equity

ρ_{debt} = required return on debt, $\rho'_{\text{debt}} > 0$

- Firm's perspective: use whichever cost of finance is cheaper, so borrow amount D^* :

$$\frac{\rho_{\text{eq}}}{[1 - \tau_{\text{corp}}]} = \rho_{\text{debt}} \left(\frac{D^*}{K} \right)$$

- This is the "static tradeoff theory" of debt policy, involves balancing costs of greater borrowing against tax savings from using debt

Digression: Taxes and the Modigliani-Miller Theorem

- M-M (1958 AER) consider debt / equity choices in a tax-free world.
- Modigliani-Miller Theorem asserts that in a perfect capital market, when investors and firms face identical debt markets, corporate debt policy has no effect on corporation value.
- Method of proof: create "Home-Made Leverage."
- Taxes invalidate the M-M theorem but the insights are very important.

Home Made Leverage Argument

- Consider a firm that invests in a \$100 project that generates a payoff of $\$X$. Assume it is initially all-equity financed with 100 shares outstanding (one share costs \$1). Payoff per share: $\frac{\$X}{100}$
- Now imagine the firm borrows \$50 at an interest rate of r . Then it issues \$50 in equity to finance the remainder of the project. The payoff per \$1 of equity (now 50 shares): $\frac{\$X - 50r}{50} = \frac{\$X}{50} - r$
- Does offering equity a payoff stream of $\$(\frac{X}{50} - r)$ per dollar of equity investment lead investors to pay a different amount for the shares than when they were offered with a payoff of $\frac{\$X}{100}$?
- Say investor wants a payoff of $\frac{\$X}{100}$ but the firm has debt. The investor buys \$0.50 of equity and \$0.50 of debt, which pays r . The payoff: $0.50 \cdot (\frac{X}{50} - r) + 0.50 \cdot r = \frac{\$X}{100}$. Thus by lending the investor can undo leverage; by borrowing she could create it.

Rough Guide to Distribution of Earnings of the Nonfinancial Corporate Sector, US, 2019

- EBIT = Earnings Before Interest and Taxes = 1700 billion
- Interest = 450 billion
- Taxes = 210 billion; Pretax Earnings = 1250 billion
- Dividends = 640 billion
- Net Share Repurchases = 450 billion
- Net Increase in Debt = 450 billion

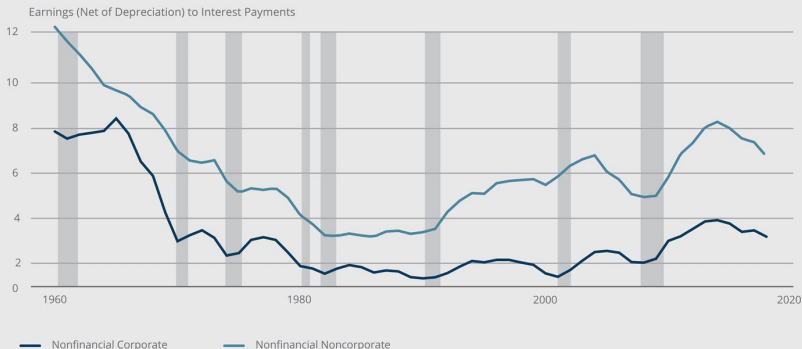
Figure 4: Debt-to-Asset Ratios of the Nonfinancial Business Sector



Note: The shaded areas indicate recessions as defined by the National Bureau of Economic Research.
Source: Financial Accounts of the United States, Haver Analytics.

Source: The Federal Reserve Bank of Boston, *The Great Leverage 2.0? A Tale of Different Indicators of Corporate Leverage*, September 28, 2020.

Figure 5: Interest Coverage Ratios of the Nonfinancial Business Sector

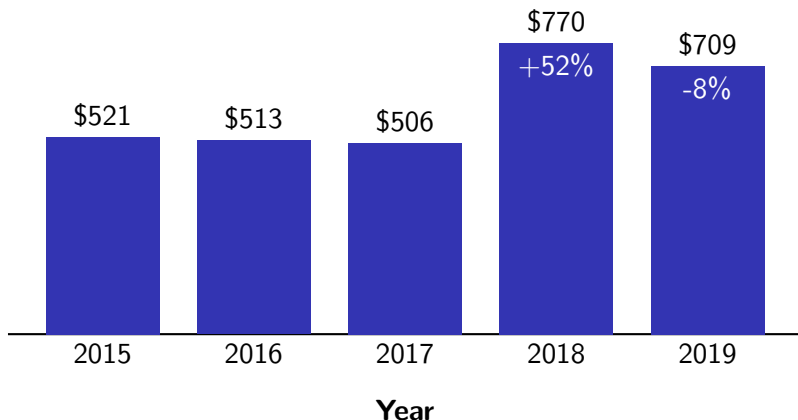


Note: Interest coverage is the ratio of interest payments over capital income net of depreciation. The shaded areas indicate recessions as defined by the National Bureau of Economic Research.
Source: Financial Accounts of the United States, Haver Analytics.

Source: The Federal Reserve Bank of Boston, *The Great Leverage 2.0? A Tale of Different Indicators of Corporate Leverage*, September 28, 2020.

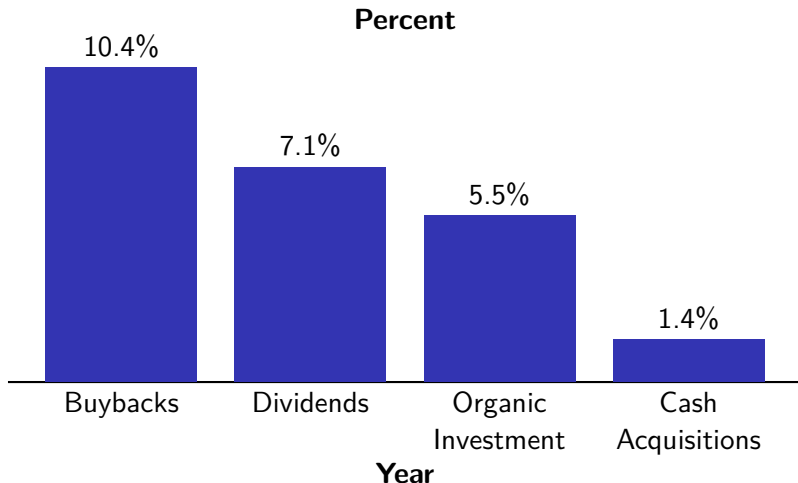
Buyback Spending by S&P 500

Billions of Dollars



Source: Fortuna Advisors LLC, 2020 Fortuna Advisors Buyback ROI Report, September 28, 2020.

Capital Deployment Annualized Growth Rates since 2015



Source: Fortuna Advisors LLC, 2020 Fortuna Advisors Buyback ROI Report, September 28, 2020.

Empirical Evidence on Borrowing Behavior

- There are few exogenous variables since firms choose investment and capital structure.
- Alex Ljungquist (JFE 2015): Uses state-level differences in corporate tax rates to identify “demand” for corporate borrowing. Tax rate increase of 1 percentage point leads to increase in borrowing of 0.4 percentage points.
- Firm issue behavior: Issuing debt tends to raise value – issuing equity reduces it (puzzle: why do firms do things that reduces equity value? Maybe they are forced to . . .)
- Estimates of bankruptcy cost: Warner on railroads (5% of value of enterprise); Cutler-Summers on Texaco-Pennzoil

Company	Value Change from Litigation	Value Change from Settlement
Texaco	-4.1B	+2.0B
Pennzoil	+1.1B	+0.3B
Total	-3.0B	+2.3B

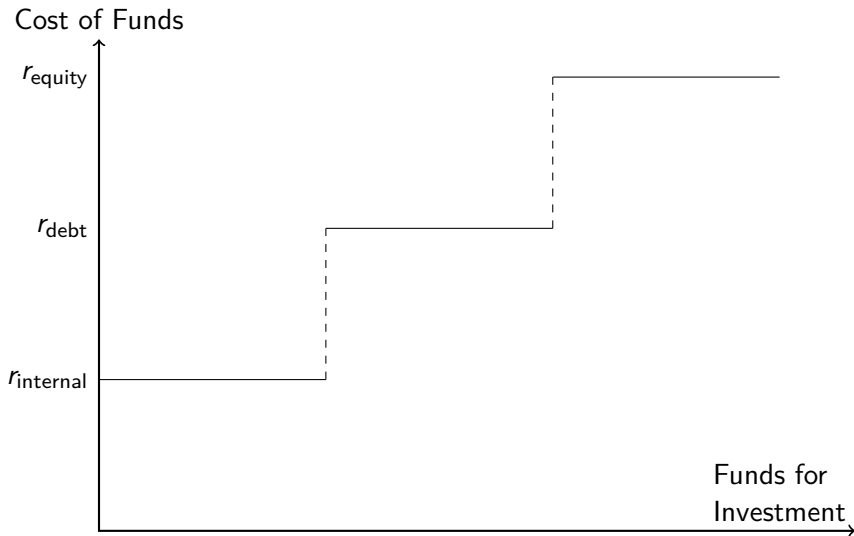
Are There Social Externalities from Corporate Borrowing?

- Global Financial Crisis Raised New Questions: Does borrowing at one firm impose externalities on the system? Are bankruptcy costs fully “internal” to the firm or are there “external” costs? “Government put” for too-large-to-fail firms is an example of an external effect.
- Veronesi & Zingales JFE 2010 paper shows that rescue programs like TARP transferred value to bondholders (“Paulson’s Gift”).
- Does debt have an efficiency role to play? Disciplining managers, changing the terms on which firms will negotiate in if they encounter financial difficulty?
- Broader question: What is the social value of financial sector? See Greenwood/Scharfstein, “Growth of Finance” JEP 2013.

Liquidity and Corporate Investment

- Neoclassical theory of investment focuses on marginal cost of capital and investment incentives (ITC, depreciation rules)
- Long empirical history: cash flow had substantial predictive value for investment at the firm level but was obviously endogenous
- Large literature in corporate finance (Myers “Pecking Order Hypothesis”) suggests internal cash flow is less expensive for firms than either debt or new equity finances
- Cash flow is another channel - besides the user cost - through which tax policy can affect investment
- Focuses attention on average tax rate as well as marginal incentives

Cost of Funds from Retained Earnings, Debt, and Equity



"Modern" Empirical Studies of Cash Flow and Investment

- Fazzari-Hubbard-Petersen (FHP, BPEA 1988) address omitted variable problem – current profitability is associated with future investment opportunities – by using Tobin's q to control for endogeneity of cash flow
- Subsequent studies use other creative identification strategies
 - FHP stratify firms by share of earnings paid out as dividends. High payout = little need for external capital
 - Kaplan/Zingales comment on FHP: low dividend firms in FHP sample are actually issuing new securities so appear to have access to capital markets
 - Owen Lamont (JFin 1997): investment decisions of multinational oil companies with chemical processing subsidiaries
 - Josh Rauh (JFin 2006): required pension contributions under ERISA as shocks to corporate cash flow
- Conclusion: access to internal cash flow appears to affect investment decisions

Effects of q and Cash Flow on Investment (FHP 1988)

	Lowest Dividend	Middle Dividend	Highest Dividend
Tobin's Q	0.0008 (0.0004)	0.0046 (0.0009)	0.0020 0.0003
Cash Flow/ K	0.461 (0.027)	0.363 (0.039)	0.230 (0.010)
R^2	0.46	0.28	0.19

Two key questions:

- Is the 0.23 coefficient for “Highest Dividend” Group a measure of misspecification?
- Are there other differences, besides capital market access, between high- and low dividend payout firms?

Taxation of Dividends: Competing Views and Empirical Evidence

- Traditional view: shareholder return is $(1 - \tau_{div}) * (1 - \tau_{corp}) * f'(k)$. The dividend tax raises the wedge between required investor return and pre-tax return on investments, reducing investment.
- “Trapped equity view” or “tax capitalization model” developed by Auerbach, Bradford, and King in late 1970s. For financial capital that is already invested in the corporate sector, if there is no alternative to paying dividends, and the marginal source of funds for new projects is retained earnings, then raising the dividend tax just reduces share values but does not discourage investment. The cost of an incremental project is a reduction in dividend payouts today. A project that costs the firm 1 costs the investor $(1 - \tau_{div})$. The comparison is now:

$$\text{Project Return: } (1 - \tau_{div}) * (1 - \tau_{corp}) * f'(k)$$

$$\text{Project Cost: } (1 - \tau_{div})$$

The ratio of return/cost, $(1 - \tau_{corp}) * f'(k)$, is independent of τ_{div} .

Taxation of Dividends (Cont'd)

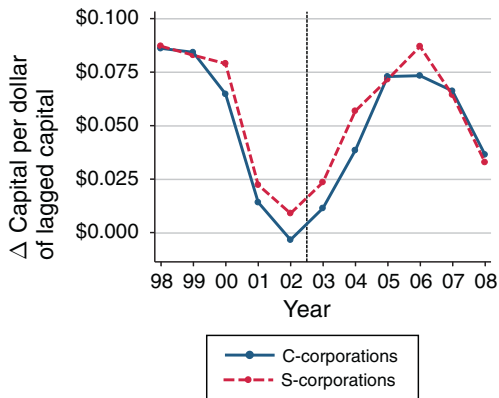
- Key distinction between traditional and “trapped equity” view: marginal source of funds for new investment. If retained earnings, no effect of dividend tax. If new equity issue, the return/cost ratio is $(1 - \tau_{div}) * (1 - \tau_{corp}) * f'(k)$ and the dividend tax does discourage investment.

“Trapped Equity” vs. “Traditional View”: Three Empirical Strategies

- Study dividend tax payments and whether they respond to changes in tax rates: Chetty & Saez QJE 2004, Poterba AER P&P 2004. It seems that firms make transitory adjustments in payout policy when dividend tax rates are changing – note the recent evidence on the 2013 tax rate increase – and (with lower confidence) that they also adjust long-run payout policy. Open question: what role for repurchases?
- Yagan (AER 2016) study of investment by Subchapter S (not affected by dividend taxes) and Subchapter C (firms that are affected by dividend taxes) after dividend tax rate falls from 39.6% to 15% in 2003. No evidence of differences in investment for the two groups of firms. Open question is how comparable the S-corp and C-corp samples are; pre-trends look very close.

Investment Effect of 2003 Dividend Tax Cut

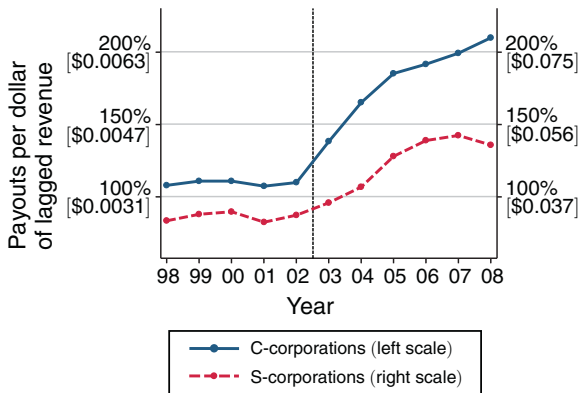
Panel B. Net investment



Source: Danny Yagan, 2016. "Capital Tax Reform and the Real Economy: The Effects of the 2003 Dividend Tax Cut," *American Economic Review*.

Payout Effects of 2003 Dividend Tax Cut

Panel D. Total payouts to shareholders



Source: Danny Yagan, 2016. "Capital Tax Reform and the Real Economy: The Effects of the 2003 Dividend Tax Cut," *American Economic Review*.