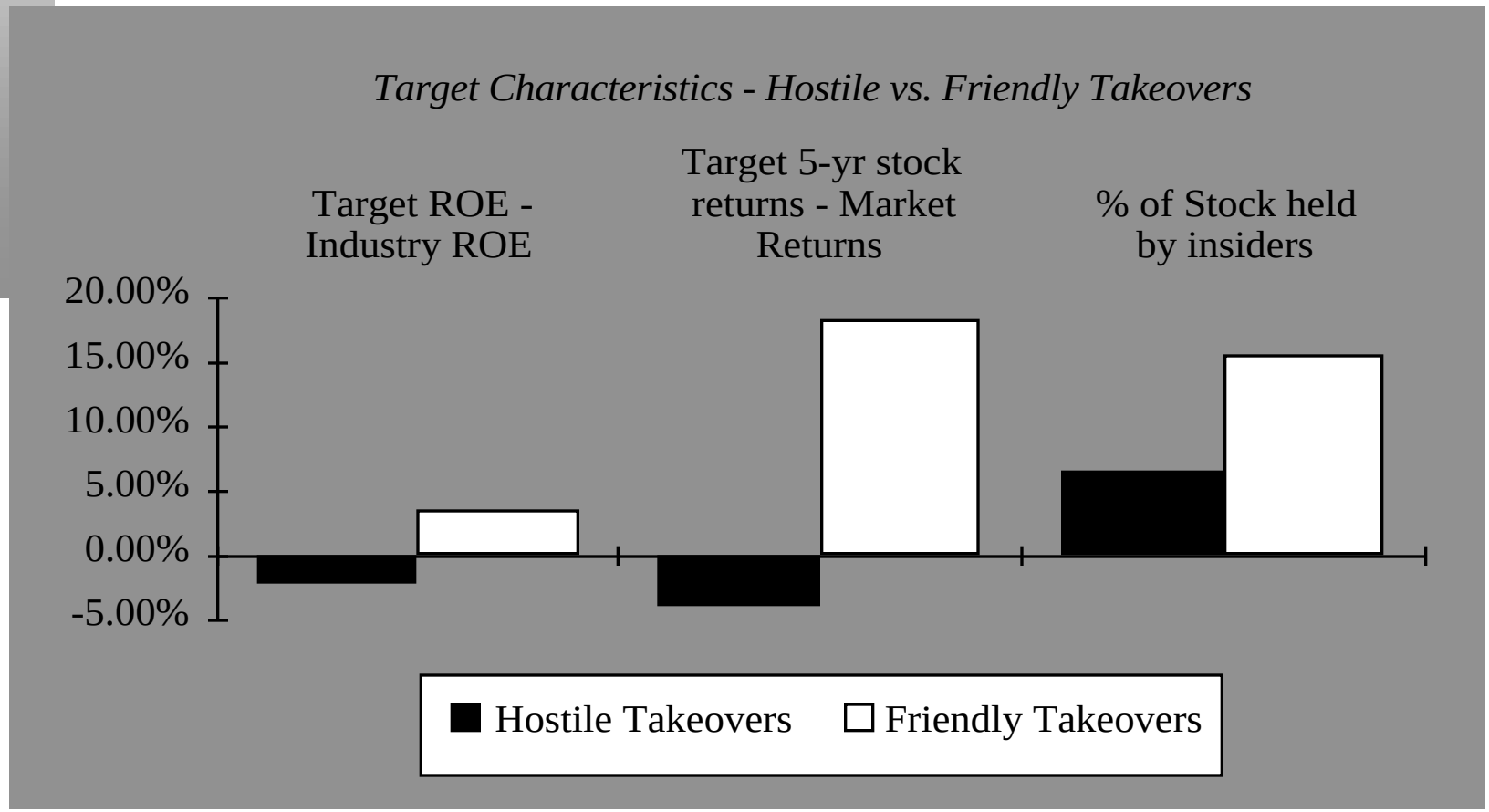
The Value of Control

- The value of control should be **inversely proportional to the perceived quality** of that management and its capacity to maximize firm value.
- **Value of control will be much greater for a poorly managed firm** that operates at below optimum capacity than it is for a well managed firm.
- Value of Control = Value of firm, with restructuring - Value of firm, without restructuring
- Negligible or firms which are operating at or close to their optimal value

Empirical Evidence on the Value of Control



After the hostile takeover..

- Many of the hostile takeovers were followed by an **increase in leverage**, which resulted in a downgrading of the debt. The leverage was quickly reduced, however, with proceeds from sale of assets.
- There was **no significant change in the amount of capital investment** in these firms, but investment was more focused on core business.
- Almost 60% of the takeovers were followed by **significant divestitures**, where half or more of the firm was divested. The overwhelming majority of the divestitures were of units which were in business areas **unrelated to the company's core business**, i.e., they constituted reversal of earlier corporate diversification.
- There were **significant management changes** in 17 of the 19 hostile takeovers, with the entire corporate management team replaced in 7 of the takeovers.

Stand Alone Valuation: Digital - Status Quo

- Digital had earning before interest and taxes of $391.38 million in 1997, which translated into a
  - A pre-tax operating margin of 3% on its revenues of $13,046 million
  - An after-tax return on capital of 8.51%
- Based upon its beta of 1.15, an after-tax cost of borrowing of 5% and a debt ratio of approximately 10%, the cost of capital for Digital in 1997 was
  - Cost of Equity = 6% + 1.15 (5.5%) = 12.33%
  - Cost of Capital = 12.33% (.9) + 5% (.1) = 11.59%
- Digital had capital expenditures of $475 million, depreciation of $ 461 million and working capital was 15% of revenues.
- Operating income, net cap ex and revenues are expected to grow 6% a year for the next 5 years, and 5% thereafter.

Digital: Status Quo Valuation

Year	FCFF	Terminal Value	PV
1	$133.26		$119.42
2	$141.25		$113.43
3	$149.73		$107.75
4	$158.71		$102.35
5	$168.24	$2,717.35	$1,667.47
Terminal Year	$156.25		

Firm Value = **$2,110.41**

- The capital expenditures are assumed to be 110% of revenues in stable growth; working capital remains 15%;
- Debt ratio remains at 10%, but after-tax cost of debt drops to 4%. Beta declines to 1.

Digital: Change in Control

- Digital will raise its debt ratio to 20%. The beta will increase, but the cost of capital will decrease.
  - New Beta = 1.25 (Unlevered Beta = 1.07; Debt/Equity Ratio = 25%)
  - Cost of Equity = 6% + 1.25 (5.5%) = 12.88%
  - New After-tax Cost of Debt = 5.25%
  - Cost of Capital = 12.88% (0.8) + 5.25% (0.2) = 11.35%
- Digital will raise its return on capital to 11.35%, which is its cost of capital. (Pre-tax Operating margin will go up to 4%)
- The reinvestment rate remains unchanged, but the increase in the return on capital will increase the expected growth rate in the next 5 years to 10%.
- After year 5, the beta will drop to 1, and the after-tax cost of debt will decline to 4%.

Digital Valuation: Change in Control

Year	FCFF	Terminal Value	PV
1	$156.29		$140.36
2	$171.91		$138.65
3	$189.11		$136.97
4	$208.02		$135.31
5	$228.82	$6,584.62	$3,980.29
Terminal Year	$329.23		

Value of the Firm: with Control Change = **$ 4,531 million**

Value of the Firm: Status Quo = **$ 2,110 million**

Value of Control = **$2,421 million**

Valuing Synergy

- The key to the existence of synergy is that the **target firm controls a specialized resource** that becomes more valuable if combined with the bidding firm's resources. The specialized resource will vary depending upon the merger:
  - *In horizontal mergers:* economies of scale, which reduce costs, or from increased market power, which increases profit margins and sales. (Examples: Bank of America and Security Pacific, Chase and Chemical)
  - *In vertical integration:* Primary source of synergy here comes from controlling the chain of production much more completely.
  - *In functional integration*: When a firm with strengths in one functional area acquires another firm with strengths in a different functional area, the potential synergy gains arise from exploiting the strengths in these areas.

Valuing operating synergy

(a) What **form** is the synergy expected to take? Will it **reduce costs** as a percentage of sales and increase profit margins (as is the case when there are economies of scale)? Will it **increase future growth** (as is the case when there is increased market power)?)

(b) **When can the synergy be reasonably expected to start** affecting cashflows? (Will the gains from synergy show up instantaneously after the takeover? If it will take time, when can the gains be expected to start showing up?)

A procedure for valuing synergy

(1) the firms involved in the merger are **valued independently**, by discounting expected cash flows to each firm at the weighted average cost of capital for that firm.

(2) the **value of the combined firm, with no synergy**, is obtained by adding the values obtained for each firm in the first step.

(3) The **effects of synergy are built into expected growth rates and cashflows**, and the combined firm is re-valued with synergy.

Value of Synergy = Value of the combined firm, with synergy - Value of the combined firm, without synergy

Synergy Effects in Valuation Inputs

If synergy is	*Valuation Inputs that will be affected are*
Economies of Scale	*Operating Margin* of combined firm will be greater than the revenue-weighted operating margin of individual firms.
Growth Synergy	More projects:*Higher Reinvestment Rate* (Retention)
	Better projects: *Higher Return on Capital* (ROE)
	Longer Growth Period
	Again, these inputs will be estimated for the combined firm.

Valuing Synergy: Compaq and Digital

- In 1997, Compaq acquired Digital for $ 30 per share + 0.945 Compaq shares for every Digital share. ($ 53-60 per share) The acquisition was motivated by the belief that the combined firm would be able to find investment opportunities and compete better than the firms individually could.

Background Data

	Compaq	*Digital: Opt Mgd*
Current EBIT	$ 2,987 million	$ 522 million
Current Revenues	$25,484 mil	$13,046 mil
Capital Expenditures - Depreciation	$ 184 million	$ 14 (offset)
Expected growth rate -next 5 years	10%	10%
Expected growth rate after year 5	5%	5%
Debt /(Debt + Equity)	10%	20%
After-tax cost of debt	5%	5.25%
Beta for equity - next 5 years	1.25	1.25
Beta for equity - after year 5	1.00	1.0
Working Capital/Revenues	15%	15%
Tax rate is 36% for both companies		

Valuing Compaq

Year	FCFF	Terminal Value	PV
1	$1,518.19		$1,354.47
2	$1,670.01		$1,329.24
3	$1,837.01		$1,304.49
4	$2,020.71		$1,280.19
5	$2,222.78	$56,654.81	$33,278.53
Terminal Year	$2,832.74		$38,546.91

- Value of Compaq = $ 38,547 million
- After year 5, capital expenditures will be 110% of depreciation.

Combined Firm Valuation

- The Combined firm will have some economies of scale, allowing it to increase its current after-tax operating margin slightly. The dollar savings will be approximately $ 100 million.
  - Current Operating Margin = (2987+522)/(25484+13046) = 9.11%
  - New Operating Margin = (2987+522+100)/(25484+13046) = 9.36%
- The combined firm will also have a slightly higher growth rate of 10.50% over the next 5 years, because of operating synergies.
- The beta of the combined firm is computed in two steps:
  - Digital's Unlevered Beta = 1.07; Compaq's Unlevered Beta=1.17
  - Digital's Firm Value = 4.5; Compaq's Firm Value = 38.6
  - Unlevered Beta = 1.07 * (4.5/43.1) + 1.17 (38.6/43.1) = 1.16
  - Combined Firm's Debt/Equity Ratio = 13.64%
  - New Levered Beta = 1.16 (1+(1-0.36)(.1364)) = 1.26
  - Cost of Capital = 12.93% (.88) + 5% (.12) = 11.98%

Combined Firm Valuation

Year	FCFF	Terminal Value	PV
1	$1,726.65		$1,541.95
2	$1,907.95		$1,521.59
3	$2,108.28		$1,501.50
4	$2,329.65		$1,481.68
5	$2,574.26	$66,907.52	$39,463.87
Terminal Year	$3,345.38		
Value of Combined Firm			= **$ 45,511**

The Value of Synergy

- Value of Combined Firm wit Synergy = $45,511 million
- Value of Compaq + Value of Digital
  = 38,547 + 4532 = $ 44,079 million
- Total Value of Synergy = $ 1,432 million

Digital: Valuation Blocks

Value of Firm - Status Quo	**= $ 2,110 million**
+ Value of Control	= $ 2,521 million
Value of Firm - Change of Control	**= $ 4,531 million**
+ Value of Synergy	= $ 1,432 million
Total Value of Digital with Synergy	**= $ 5,963 million**

Estimating Offer Prices and Exchange Ratios

- There are 146.789 million Digital shares outstanding, and Digital had $1,006 million in debt outstanding. Estimate that maximum price you would be willing to offer on this deal.

- Assume that Compaq wanted to do an exchange offer, where it would exchange its shares for Digital shares. If Compaq stock is trading at $ 27 per share, what would be the exchange ratio?

Evaluating Compaq's Offer

Value of Digital with Synergy	=	$5,963 mil
- Value of Cash paid in deal = $ 30 * 146.789 mil shrs =		$4,403 mil
- Digitial's Outstanding Debt (assumed by Compaq)		$1,006 mil
Remaining Value		$ 554 mil
/ number of Shares outstanding		146.789
= Remaining Value per Share		$ 3.77
Compaq's price per share at time of Exchange Offer		$ 27

Appropriate Exchange Ratio = 3.77/27 = 0.14 Compaq shares for every Digital share

Actual Exchange Ratio = 0.945 Compaq shares/Digital Share