

The Conceptual Company

Risks and Rewards

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What Is a Conceptual Company?

- Negligible physical assets: PP&E, inventories.
- Intangibles-intensive: R&D, brands, alliances, human resources, organization capital.
- Strong patent/trademark protection.
- Extensive outsourcing of manufacturing, distribution and other low-knowledge functions.
- Extensive trade in intellectual property (IP): Patent sale and licensing, know-how sale.

Cisco Systems As Conceptual Co.

- Investments in fiscal 2006 (scaled by total assets):

Property and equipment:	2.3%
Technology/business acquisition:	16.0%
Research and development:	12.3%
Marketing	17.8%

- Specific assets—end of fiscal 2006 (scaled by total assets):

Inventories	3.2%
Property and equipment	7.9%
Goodwill and Intangibles	26.3%

	<u>Cisco</u>	<u>Boeing</u>	<u>Exxon</u>
•Gross margin ratio (2006)	66%	18%	41%

The Rewards of Being Conceptual

- Scalability of operations is limited only by demand (drug sales).
- Virtually zero marginal costs (search engines).
- Network externalities—Positive feedback (Microsoft operating system).
- Customers are often “locked-in” (high switching costs). (Airlines’ loyalty programs).

And the Risks Are

- Heavy, largely irreversible sunk-costs, upfront investments in R&D, technology, brands (new drug development = \$1 billion).
- Competition pushes prices to zero (\$100 laptop).
- Property rights on most intangibles either nonexistant (human capital) or hard to enforce (know-how). (RIM's patent settlement).
- Disruptive technologies (wireless communication).

Demonstrating the Incremental Risk of Conceptual Investments

- Impairment (writeoffs) of goodwill vs. physical assets (scaled by total assets) in various 2-digit industries with >25 firms: 2001-2005.

<u>Industry</u>	<u>Goodwill</u>	<u>Physical Assets</u>
Food and kindred products	.011	.006
Printing, Publishing	.025	.008
Chemicals And Allied Products	.019	.011
Rubber And Plastics	.031	.007
Primary Metal Industries	.007	.012
Machinery And Computer Equipment	.023	.009
Electronic And Other Electrical Equipment	.139	.020
Transportation Equipment	.004	.006

<u>Industry</u>	<u>Goodwill</u>	<u>Physical Assets</u>
Measuring, Analyzing, And Controlling Instruments	.111	.009
Communications	.058	.016
Wholesale Trade-non-durable Goods	.028	.005
Miscellaneous Retail	.021	.007
Business Services (software)	.113	.022
Health Services	.072	.011

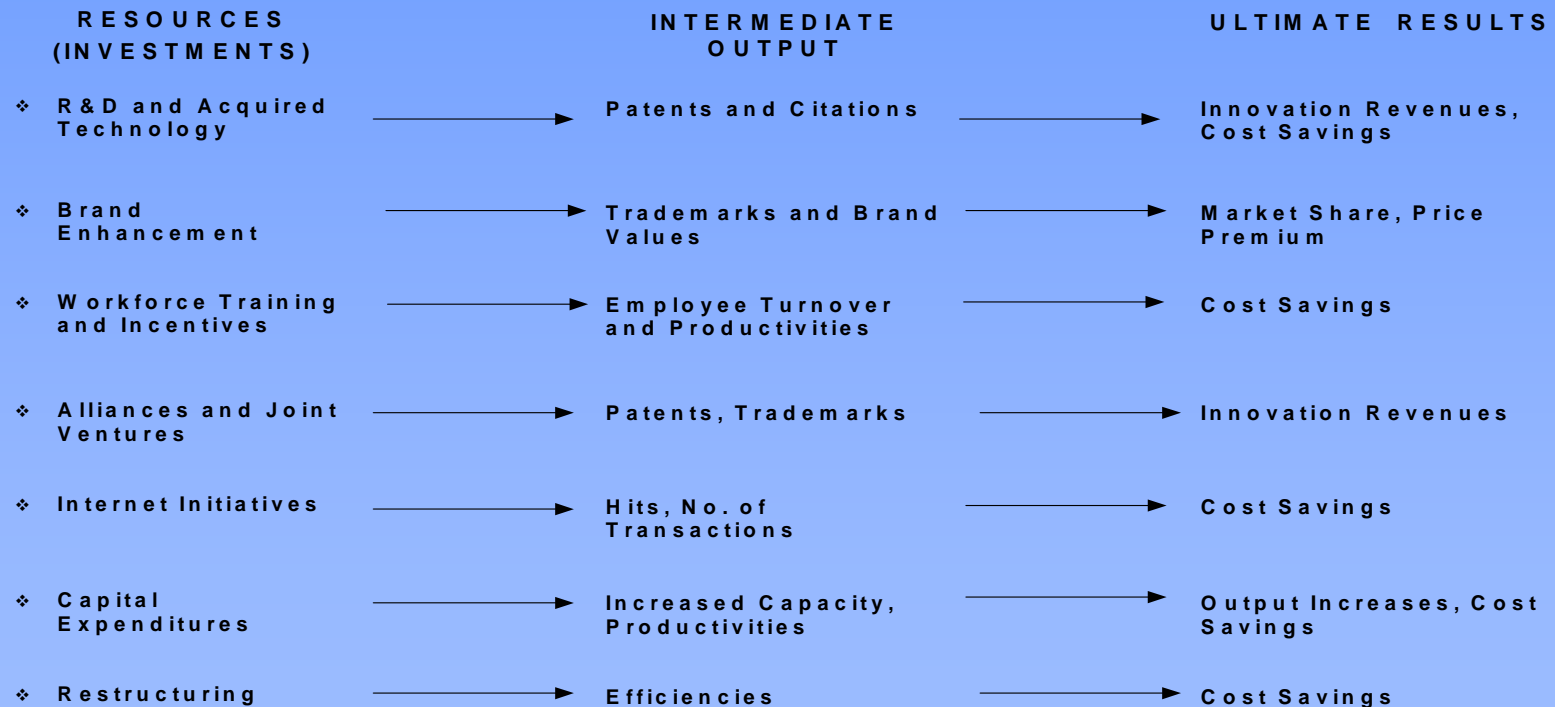
And the Inevitable Regression

(Period: 2001-05. T-value in Paren)

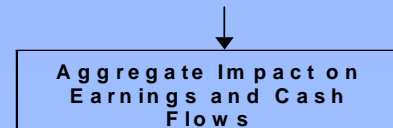
$$\begin{aligned} \text{Goodwill} &= .001 + .070 \text{ R\&D} - .016 \text{ Cap Ex} - .012 \text{ Op. Marg} \\ \text{Impairment} &\quad (2.58) \quad (-0.25) \quad (-3.59) \\ & \\ &- .001 \text{ Size} + .020 \text{ Divers} + .007 \text{ Beta} \\ &\quad (-0.66) \quad (4.28) \quad (4.88) \\ & \\ &+ .105 \text{ RetVol} ; R^2 = 26.6\% \\ &\quad (5.68) \end{aligned}$$

In Defense of Concepts (Risk Mitigation)

•First and foremost—know thy intangibles



Facts, Not Conjectures



FACTS, NOT CONJECTURES

Ad Hoc Risk Mitigation Measures (My Experience)

- Leakage of IC in Dow Chemical's alliances.
- “Everything for sale” at IBM.
- Securitization of IP—risk sharing.
- Product pipeline disclosure at Novartis.
- Slaying glass blowers and families in Venice (13-14 Century).

Organization Capital: The Most Important & Vulnerable Asset

Definition:

“Organization capital is the knowledge used to combine human skills and physical capital into systems for producing and delivering want-satisfying products.” (Evenson and Westphal, 1995).

It is the agglomeration of technologies, business practices, processes and designs, as well as incentive/compensation systems, embedded in:

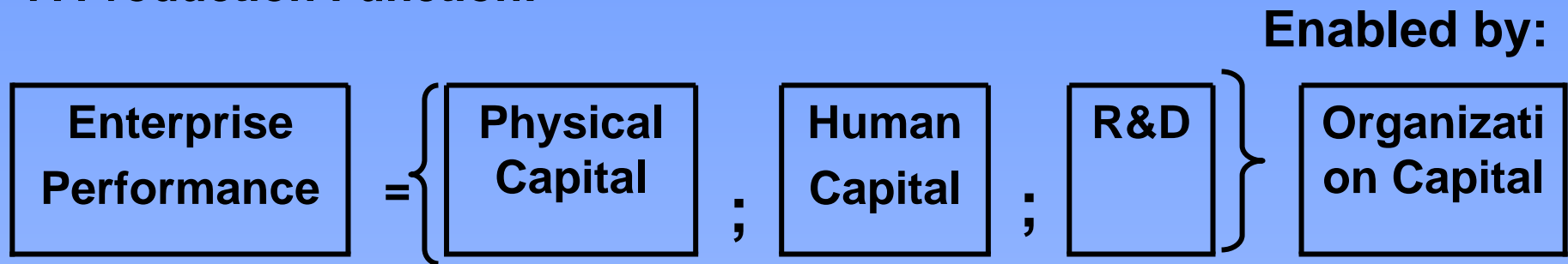
Operating capabilities: such as product design systems, production management & engineering, input outsourcing (supply channels), and marketing technologies.

Investment capabilities: such as advanced project selection methodologies, financial engineering and risk management.

Innovation capabilities: such as scientific R&D, adaptive capacity, knowledge management, IP protection.

The Measurement of Organization Capital* (Inspired by Economic Growth Theory)

A Production Function:



*From B. Lev and S. Radhakrishnan, "The Valuation of Organization Capital," in Measuring Capital in the New Economy, Corrado, Haltiwanger and Sichel, eds., National Bureau of Economic Research, 2005.

Proof of Concept: Does Organization Capital Affect Shareholder Value?

Equity Valuation Model

$$\text{Enterprise Value} = \text{Assets In Place} + \text{Growth Potential}$$

$$\text{Growth Potential} = \text{Present Value Abnormal Earnings} = \frac{\text{Expected Earnings}^*}{\text{Minus Cost of Equity}} + \text{Terminal Enterprise Value}$$

Inserting our estimate of organization capital:

$$\text{Enterprise Value} = \text{Assets In Place} + \text{Growth Potential} + \text{Organization Capital}$$

Why the Vulnerability of Organization Capital?

- Ineffective patent protection (Dell's “built to order”).
- Much of the know-how is tacit (“walks out in the evening”)—Intel's founders.
- Unmeasured by accountants, hence largely ignored internally (GM's software “assets”).

Dire Consequences

- Dell's fall from grace, predicted by organization capital.

Dell: Organization Capital Leading Earnings, Sales and Stock Prices

