



*Defense-Industrial
Initiatives Group*

The Health of the U.S. Defense Industry “In the Eye of a Perfect Storm”

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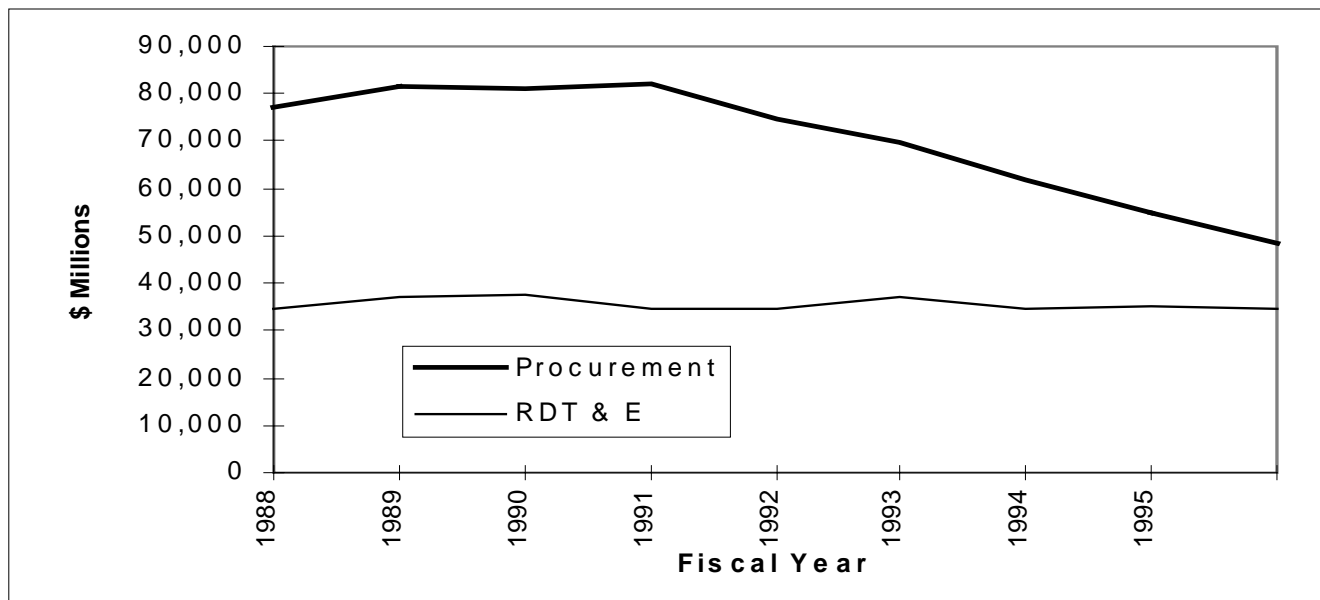
February 19, 2004



The 1990s “Perfect Storm”

Elements of the “Perfect Storm” - Procurement Was Cut Dramatically After the Cold War...

- **Procurement account down 40% 1990-1996**
- **RDT&E account down 8% 1990-1996**
- **Meanwhile, Personnel down 13%, O&M up 4% and Milcon up 11%**



- **Ammo budgets drop from \$5.6 billion in 1985 to \$1.5 billion**

Elements of the “Perfect Storm” – Changes in Business Philosophy

- **1980s/1990s saw**
 - **Attacks on the multi-industrial firm/conglomerate**
 - **1980s hostile takeovers/leverage buyouts – break up the conglomerate**
 - **Be number one/number two or get out**
 - **Stick to your knitting**
 - **More sophisticated and active investors**
 - **Diversification undertaken at investor portfolio level rather than corporate**

Phase I Consolidation Triggered By Budget Declines

Key Characteristics	<ul style="list-style-type: none"> ▪ Started when defense budget turned down ▪ Buyers are strategic players as well as financial
Time Frame	1986 - present
Examples	<ul style="list-style-type: none"> • Chrysler Gulfstream to LBO house • Ford Aerospace to Loral • Goodyear Aerospace to Loral • Hercules Aircraft to BFGoodrich • LTV (Vought) to Loral and Northrop Grumman • GE Aerospace to Martin Marietta • Penn Central Vitro to Tracor • IBM Federal Systems to Loral • Honeywell / Alliant Techsystems spin off • Ryder / Aviall spin off • Unisys to Loral • Hercules Space to Alliant Techsystems • Black & Decker PRC to Litton • TRW Defense to Northrop Grumman • Alcoa Thiokol Propulsion to Alliant Techsystems

*Elements of the “Perfect Storm” –
There Was a New Environment After the Cold War*

- **Weapon systems more complex and expensive to develop**
Example: F-22 fighter development costs 2.5 times F-16
- **Fewer programs are launched**
Example: Fighters introduced

in 1940s: 17	in 1980s: 2
in 1950s: 9	in 1990s: 2
in 1960s: 9	in 2000s: 1
in 1970s: 6	
- **Programs take longer to go from development to production, more "stretch outs"**
- **Higher technical, political and service-specific risk**
- **RESULT: Need to reduce industry capacity and create larger companies with "deep pockets" and a breadth of capabilities/programs**

*Elements of the “Perfect Storm” –
Pentagon Established Consolidation Rules*

- **Secretary of Defense Perry hosts "Last Supper" and announces that the Pentagon cannot afford to keep everyone in business**
- **Industry told it must consolidate, but Pentagon says it will not decide who or how (directly...still has influence through program decisions)**
- **Pentagon establishes a merger review process (focuses on concentration within industry segments, access to technologies and ability of companies to survive)**
- **Pentagon agrees to reimburse merger-related restructuring costs in exchange for cost savings and lower prices**

Phase II Consolidation Followed

	Sector Consolidation/ Horizontal
Key Characteristics	<ul style="list-style-type: none"> • Gain critical mass within a sector • Primary benefits are consolidation savings, eliminate capacity
Time Frame	1992 - present
Examples	<ul style="list-style-type: none"> • GD Missiles to Hughes • GD Fort Worth to Lockheed • Sundstrand DataControl to AlliedSignal • GD Space Systems to Martin Marietta • Norden Systems to Westinghouse • Grumman to Northrop • FMC / Harsco JV • Teledyne Data to Litton • Allison Engine to Rolls-Royce • Bath Iron Works to General Dynamics • Allied Signal Actuation to Moog • AEL to Tracor • Magnavox to Hughes • Chrysler Technologies to Raytheon • Teledyne Vehicle to General Dynamics • Texas Instruments / Hughes to Raytheon • GenCorp Aerojet and United Technologies • Santa Barbera to General Dynamics • Newport News to Northrop Grumman

Elements of the “Perfect Storm” – Key Issues Related to Vertical Integration

- **Mass becomes even more critical to the industry as budgets continue dropping**
- **Technologies shifting - electronics becoming the value-added component**
 - ▲ **Example - first generation/unguided missiles the key was speed and propulsion, key players were chemical/motor players; now the key is the sensor and guidance, key players are electronics houses**
 - ▲ **Who should be prime? - metal bender or electronics house**
 - ▲ **Players vertically integrate to understand the technology or satisfy market trend**
- **Electronics related budgets have suffered the least**
- **Sources of technical innovation**

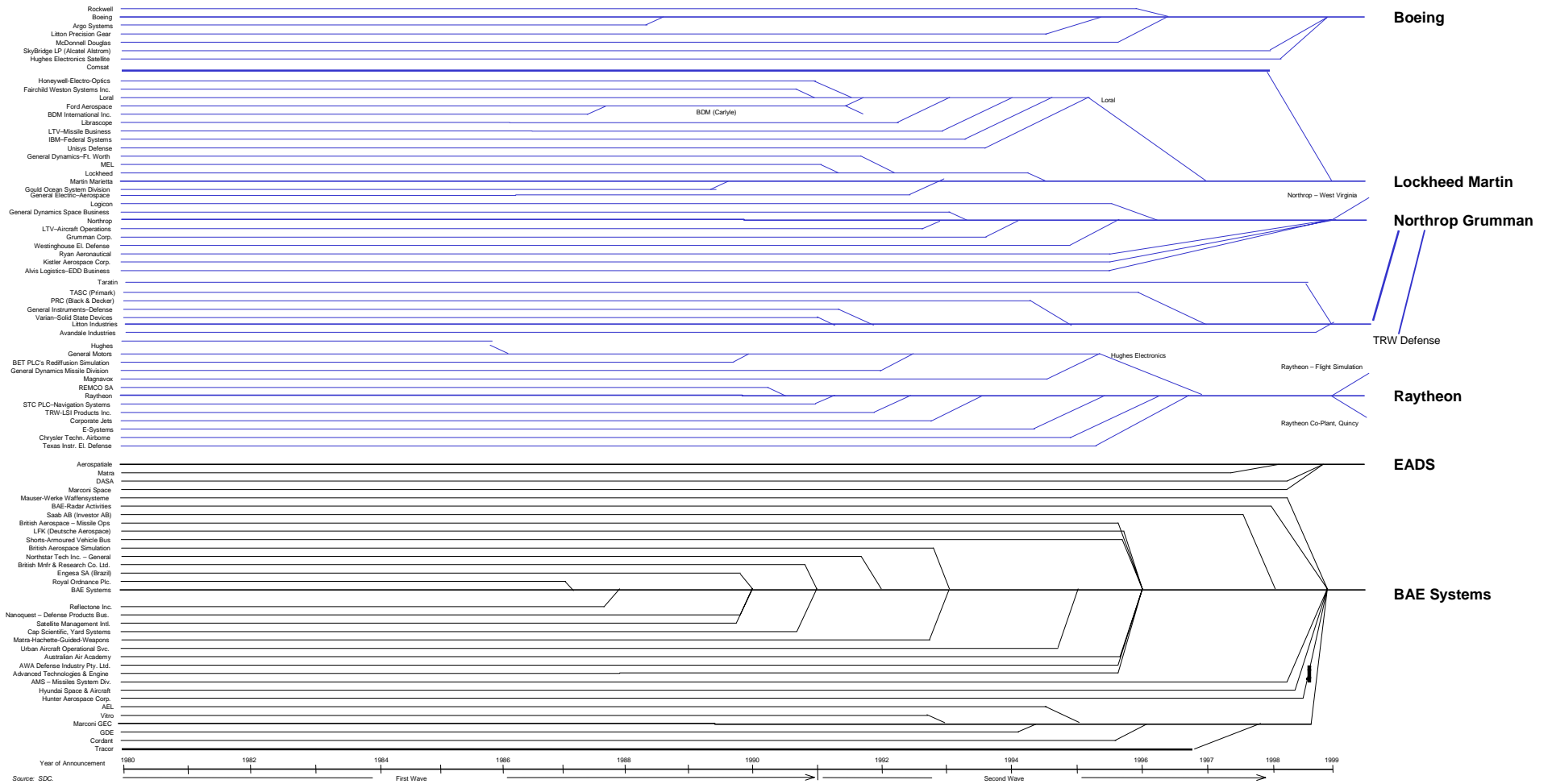
Phase III Consolidation Followed

	"Broadening"/ Vertical Consolidation
Key Characteristics	<ul style="list-style-type: none"> • Broaden business base and increase industry critical mass • Add complementary businesses • Reduce overhead, R&D, cross sell products
Time Frame	1995 - present
Examples	<ul style="list-style-type: none"> • E-Systems to Raytheon • Lockheed with Martin • Loral to Lockheed Martin • Rockwell Defense to Boeing • Westinghouse Defense to Northrop Grumman • McDonnell Douglas to Boeing • Logicon to Northrop Grumman • Northrop Grumman to Lockheed Martin (failed) • GEC Marconi to British Aerospace • Federal Data to Northrop Grumman • Motorola Fuze by Alliant Techsystems

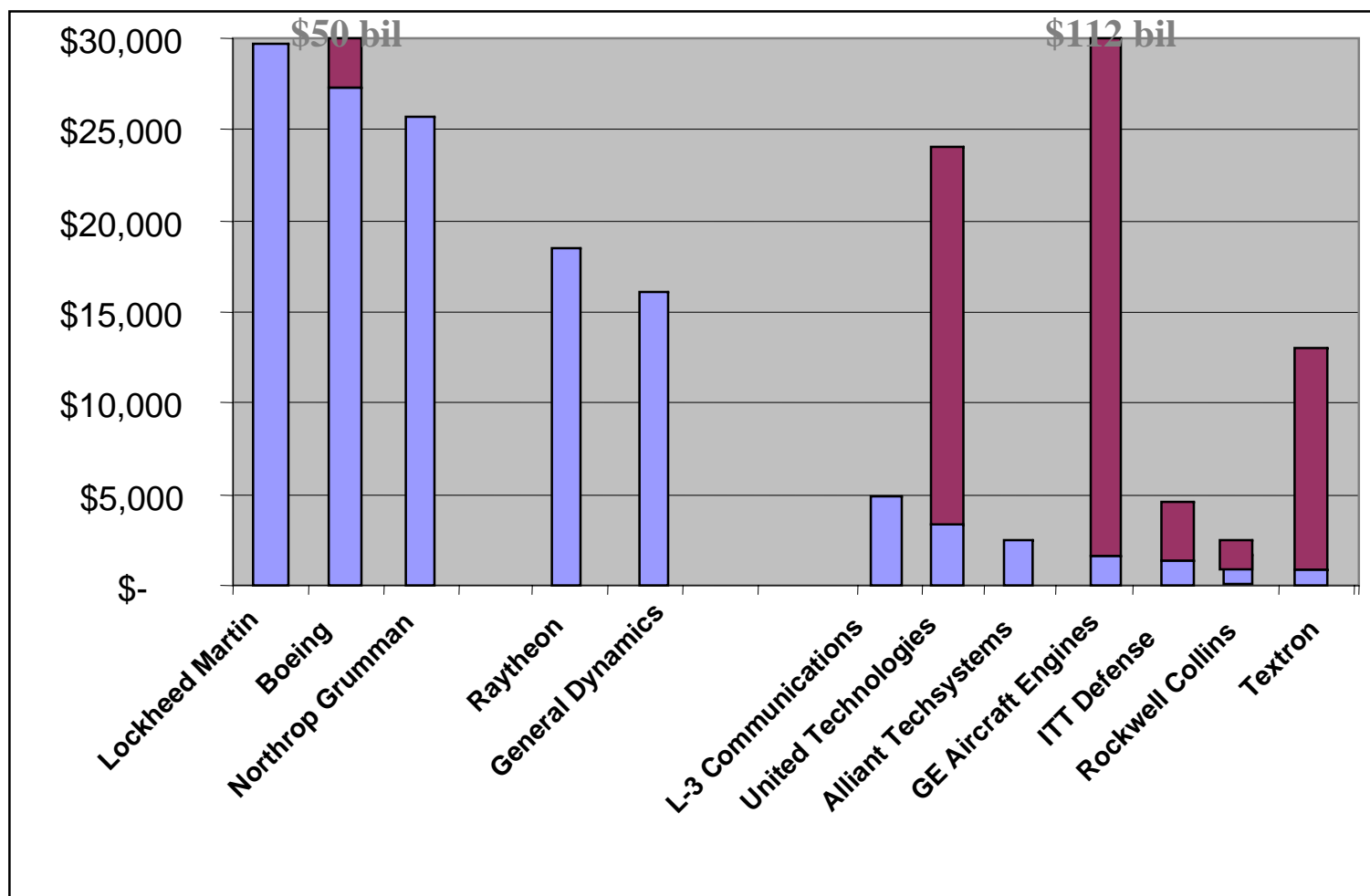
Current Structure of the Industry “The Eye of the Storm”



A Decade of Consolidation...



Has Resulted in A Three-Tiered U.S. Defense Industry..





Reflecting a True "Peacetime" Industry...

**"Peace"
1927-1933**

**Cold War
1980's**

**"Peace"
1995-2002**

UA&T	42.3%	Boeing	16.9%	Boeing	36%
Curtiss-Wright	38.7%	McDonnell Douglas	11.3%	Lockheed Martin	17%
Douglas	8.6%	United Technologies	9.1%	Northrop Grumm.	13%
Glenn Martin	5.4%	Lockheed	8.4%	Raytheon	10%
Consolidated	2.9%	General Electric	5.8%	General Dynamics	7%
Great Lakes	1.8%	General Dynamics	5.7%	General Electric	6%
Grumman	0.3%	Rockwell	5.6%	L-3 Communications	3%
		Raytheon	5.4%	United Technologies	3%
		Martin Marietta	4.9%		

Concentrated

Fragmented

Concentrated

Defense-Industrial Ghetto?

Top 20 Defense Contractors

1980

General Dynamics
McDonnell Douglas
United Technology
Boeing
General Electric
 Lockheed
Hughes
Raytheon
Tenneco
Grumman
 Northrop
Motor Oil Hellas
Chrysler
Rockwell
Westinghouse
Sperry
FMC
Martin Marietta
Honeywell
Litton

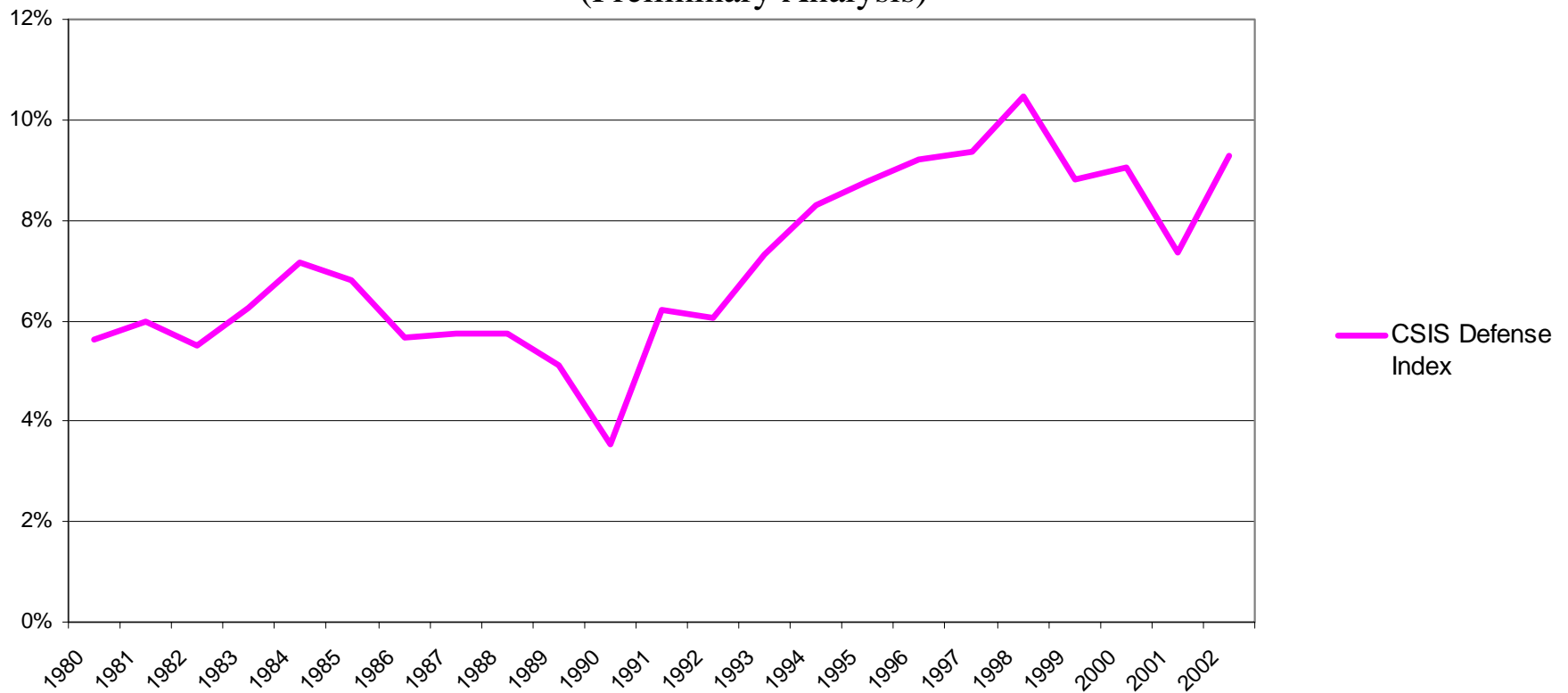
2002

Lockheed Martin
Boeing
 Northrop Grumman
Raytheon
General Dynamics
United Technologies
SAIC
TRW
Healthnet
 L-3 Communications
General Electric
 United Defense
 Dyncorp
Humana
Honeywell
BAE Systems
 Bechtel
ITT
Textron
 Triwest

Pure Defense Aero/Defense Multi Pure Commercial
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Defense Margins Have Improved, BUT...

Industry Average Operating Margin (weighted by revenue)
(Preliminary Analysis)

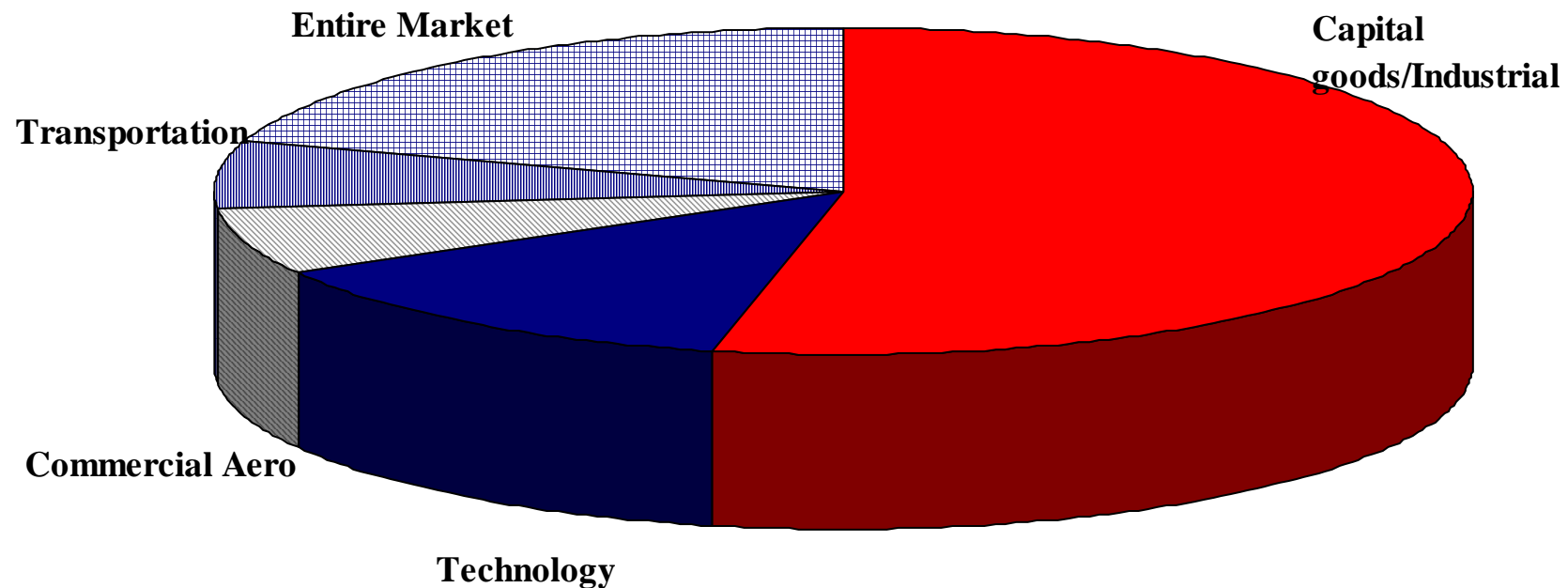


Sources: FactSet, S&P Compustat, Energy Information Administration, CSIS Analysis

Notes: 1) CSIS Defense Index comprises 36 publicly-traded companies with majority revenues derived from US defense business.
 (2) S&P Sub-sector constituents accurate back to 1994; composition held constant for years 1980 to 1993.

Defense Industry Does Not Operate in a Vacuum

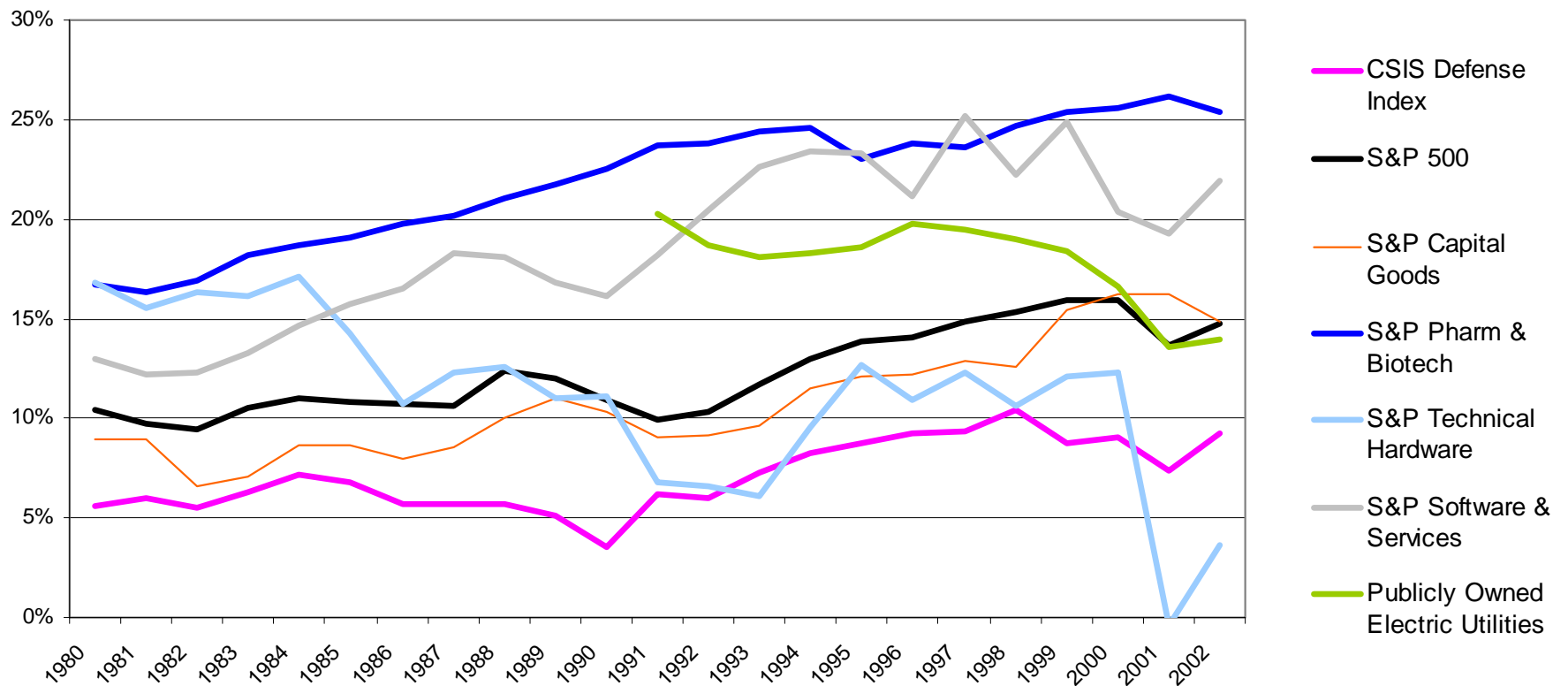
- **What are the alternative investments when you consider the defense sector?**



Source: CSFB survey

Defense Industry in Context – Lowest Returns of Peers

Industry Average Operating Margin (weighted by revenue)



Sources: FactSet, S&P Compustat, Energy Information Administration, CSIS Analysis

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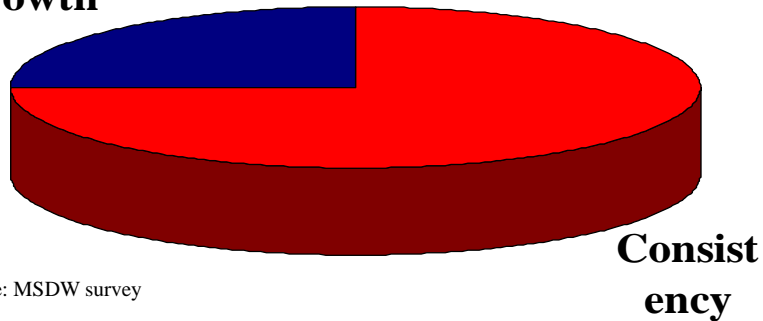
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Investors Prized the Industry for its Stability

- What is more important to you: top-line growth or consistency of earnings?

1999

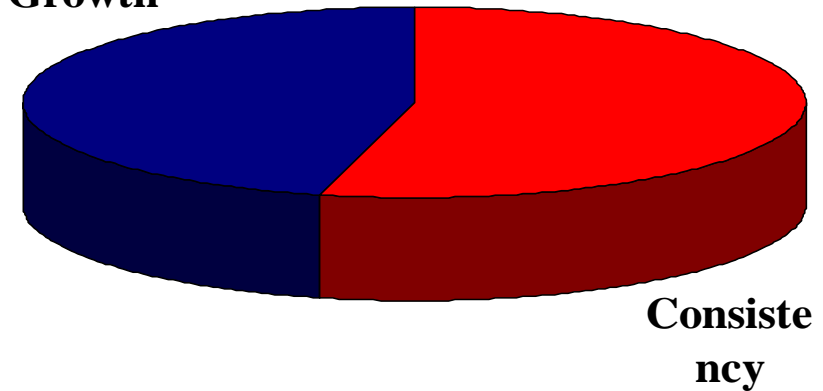
Growth



Source: MSDW survey

2002

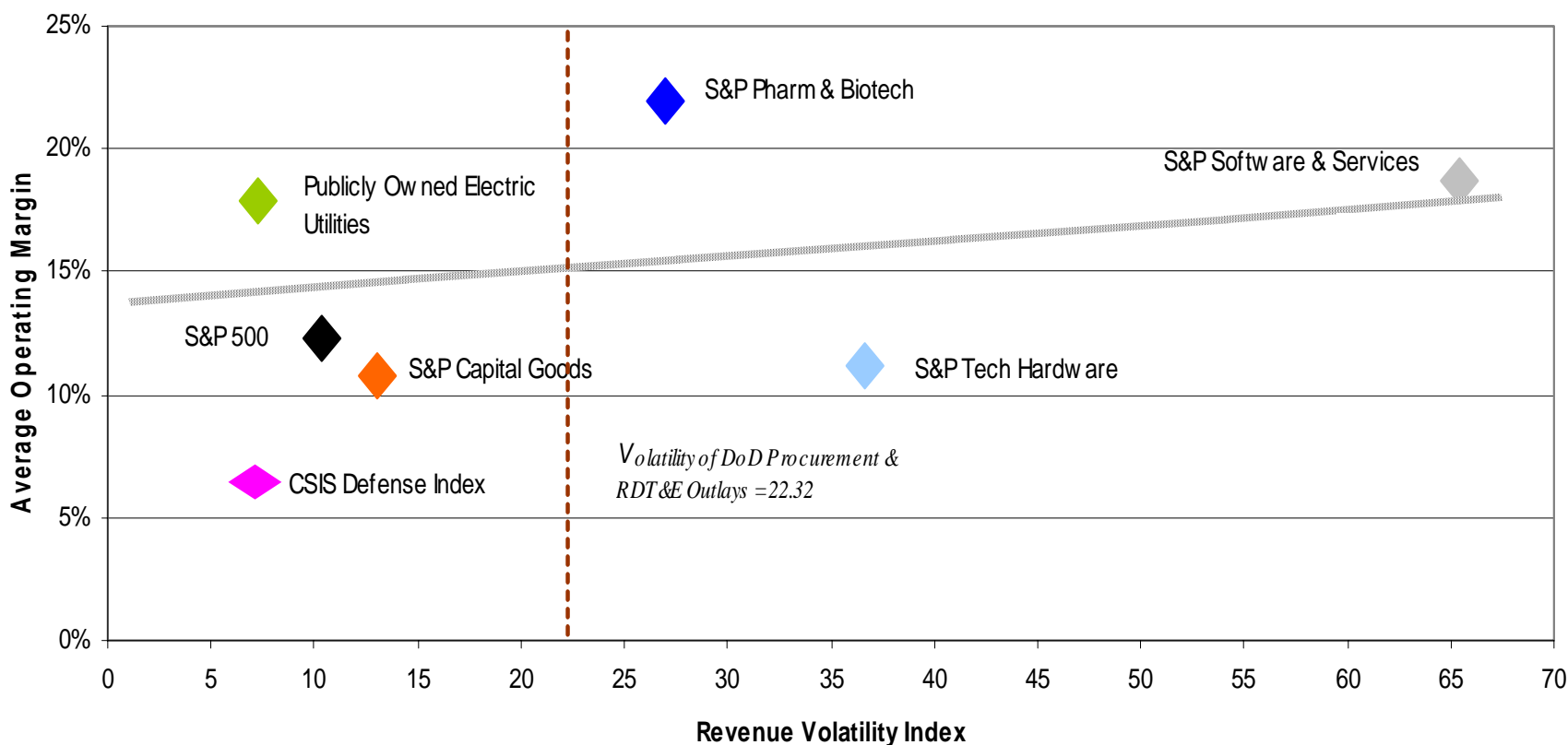
Growth



“Predictability of source and level of earnings, as opposed to smoothness”

The Disconnect – Defense More Volatile Than Expected

Industry Revenue Volatility versus Average Operating Margin (weighted by revenue)

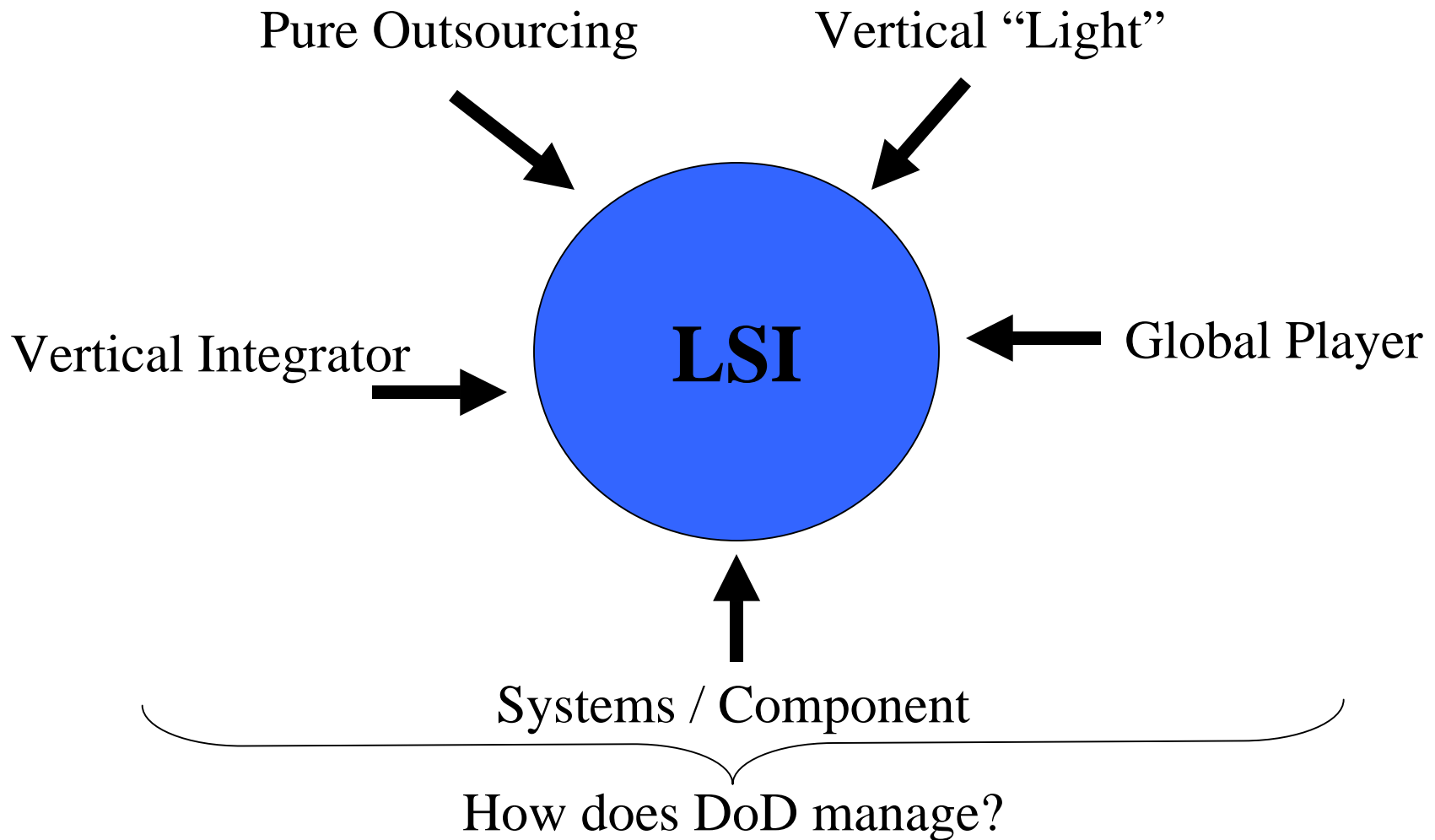


Sources: FactSet, S&P Compustat, Energy Information Administration, CSIS Analysis

Notes: 1) CSIS Defense Index comprises 36 publicly-traded companies with majority revenues derived from US defense business. (2) S&P Sub-sector constituents accurate back to 1994; composition held constant for years 1980 to 1993. (3) Operating Margin data averaged between 1980 and 2002, except for Electric Utilities (1991-2002 only).

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Key Questions on Future Industry Structure...



Key Questions on Future Industry Structure...

- **Defense vs. National Security**

- **Is Homeland Security real?**
- **Who will respond?**

- **Civil-Military Integration**

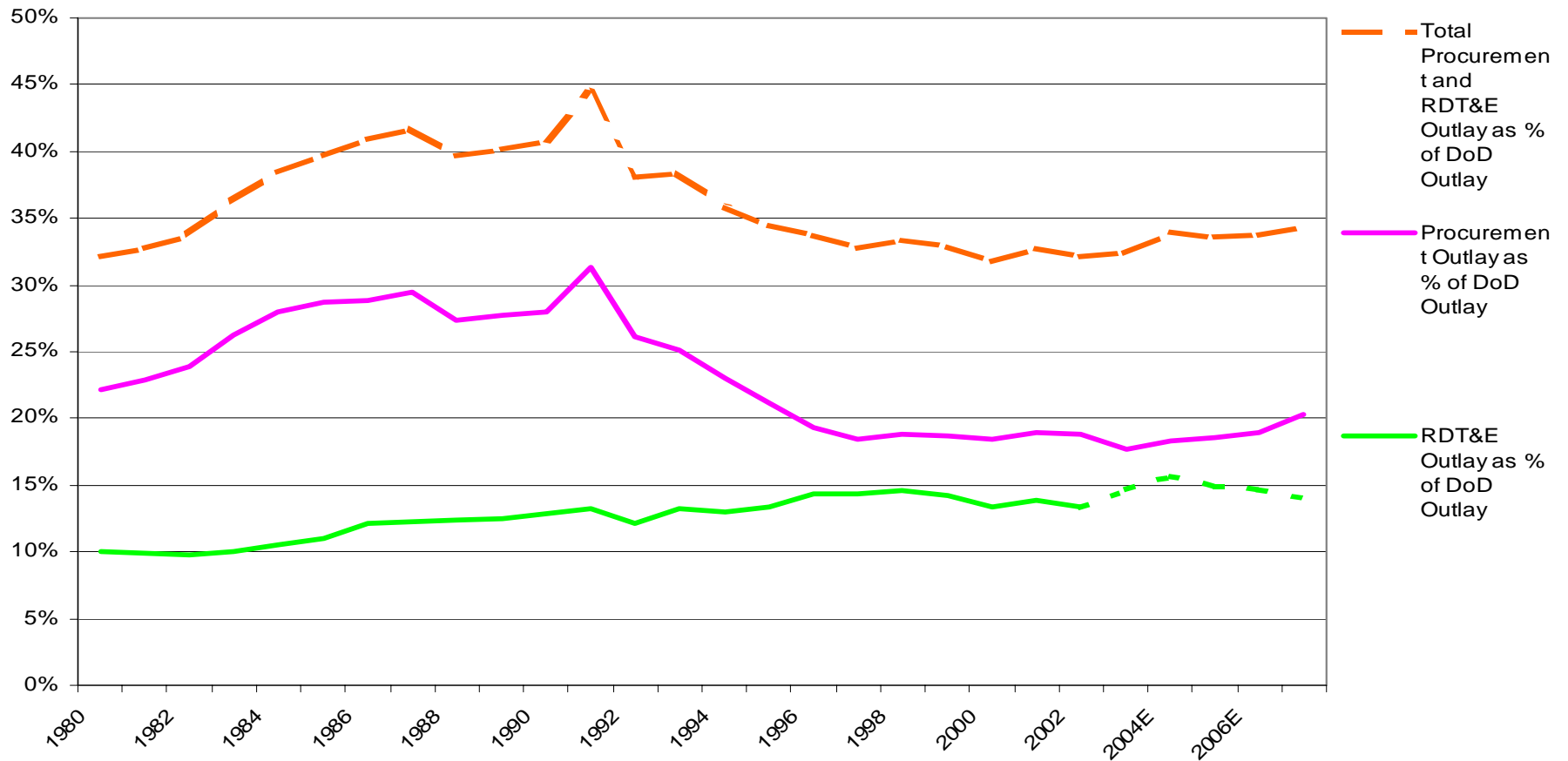
- **Transformation**

- **What does it mean?**
- **Who will be the true leaders? Traditional players or new comers**

The Future: The Other Side of the “Perfect Storm”

Budget Pressures – Investment Still “Bill Payer”

Procurement and RDT&E Outlay as % of Total DoD Outlay



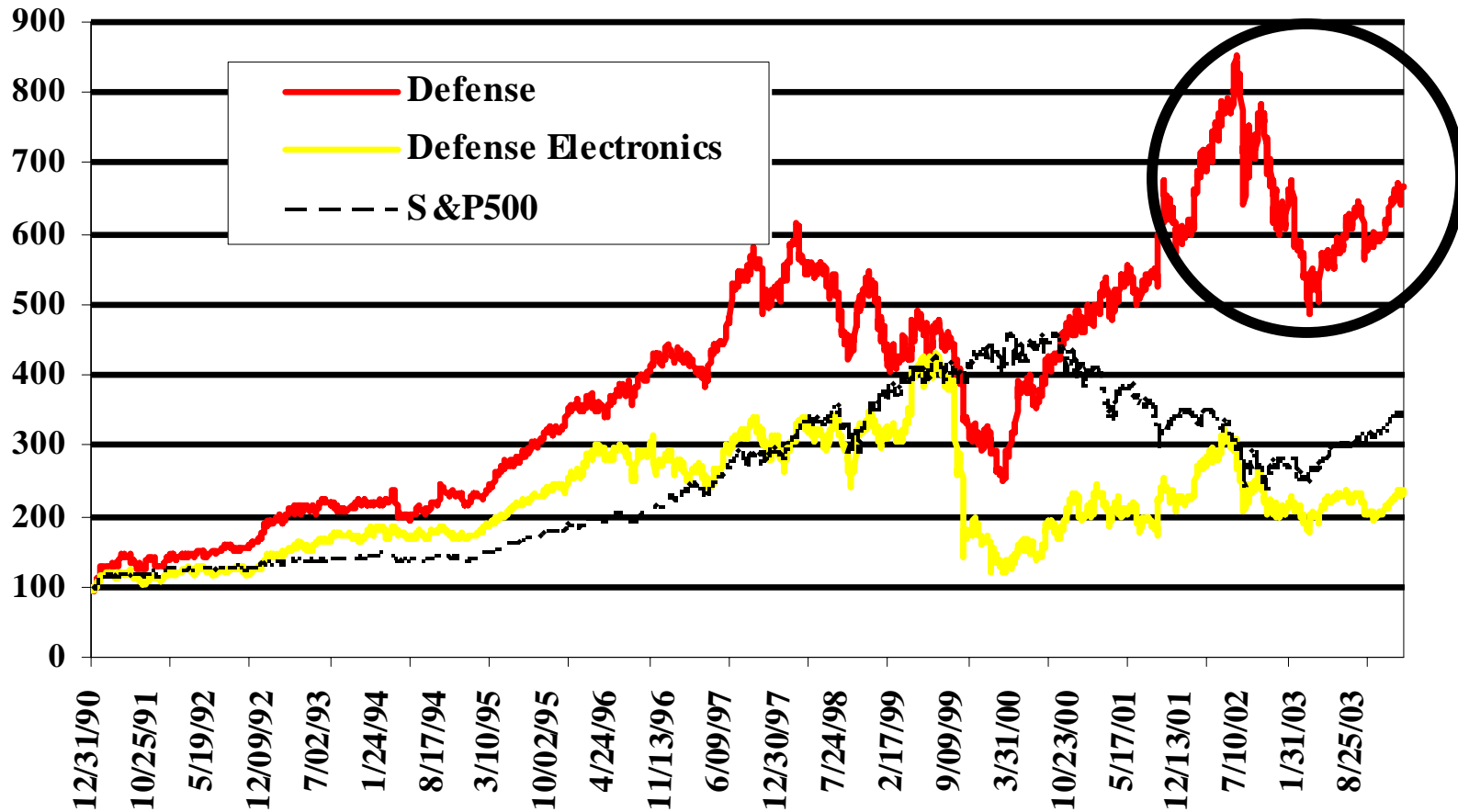
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Source: Budget of the United States Government, Fiscal year 2004

Budget Pressures

- **How long before the next downturn?**
 - **Iraqi War costs**
 - **At what point does the supplementals tactic end**
 - **Budget deficits**
 - **2004 Presidential elections**
 - **FY06 onwards budget issue**
 - **Growth in end strength**
 - **O&M "death spiral"**
 - **Upgrade versus replace/modernize**
 - **Baby Boomer retirement**
 - **Cost risk**

Stock Market Already Factoring in a Decline



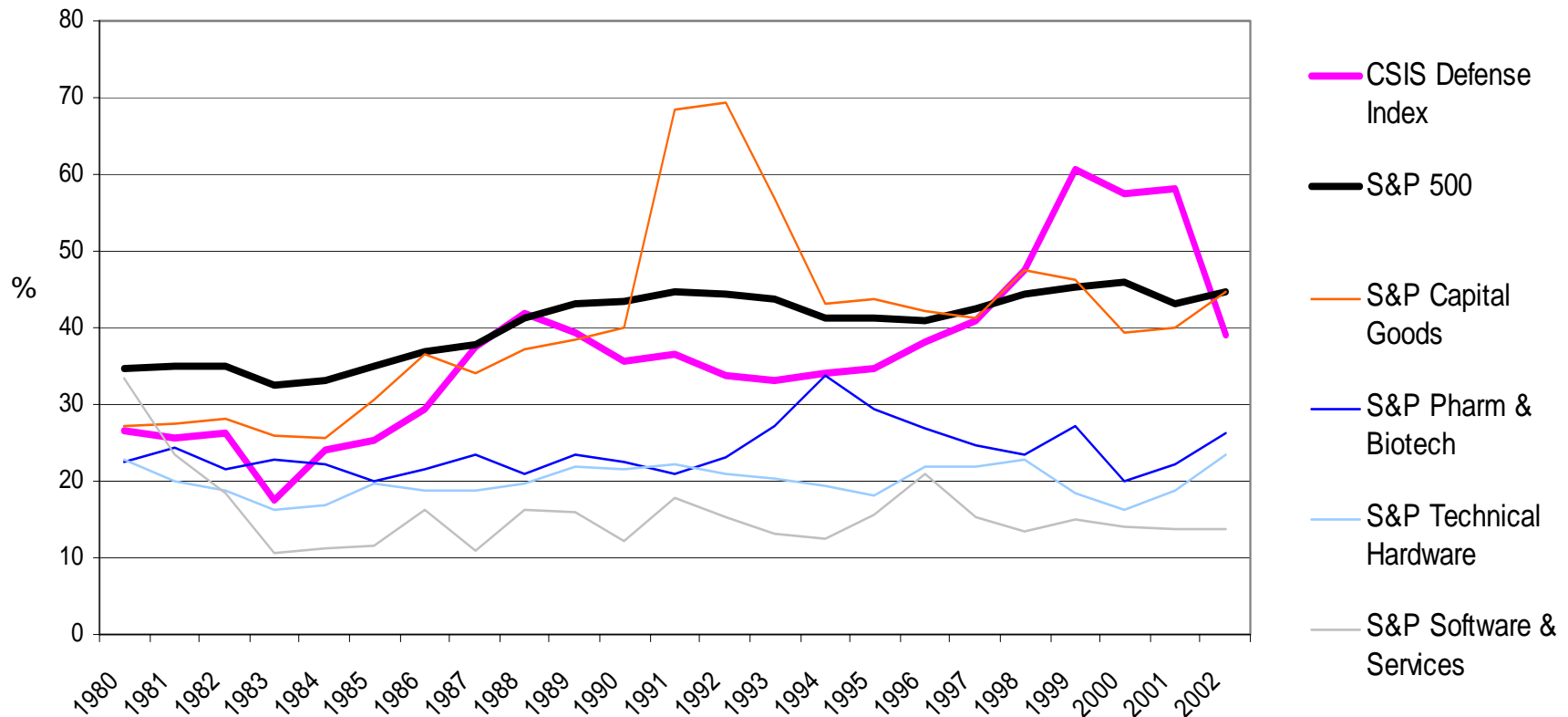
Defense = Alliant Techsystems, General Dynamics, Grumman, Litton, Lockheed Martin, Martin Marietta, Northrop, Northrop Grumman, Newport News

Defense Electronics = E-Systems, L-3 Communications, Logicon, Loral, Raytheon, Tracor

Source: Factset, CSFB Analysis, CSIS Analysis

Even Though Defense Companies Have Lowered Debt

Industry Average Debt to Capitalization (unweighted)
(Preliminary Analysis)



Sources: FactSet, S&P Compustat, CSIS Analysis

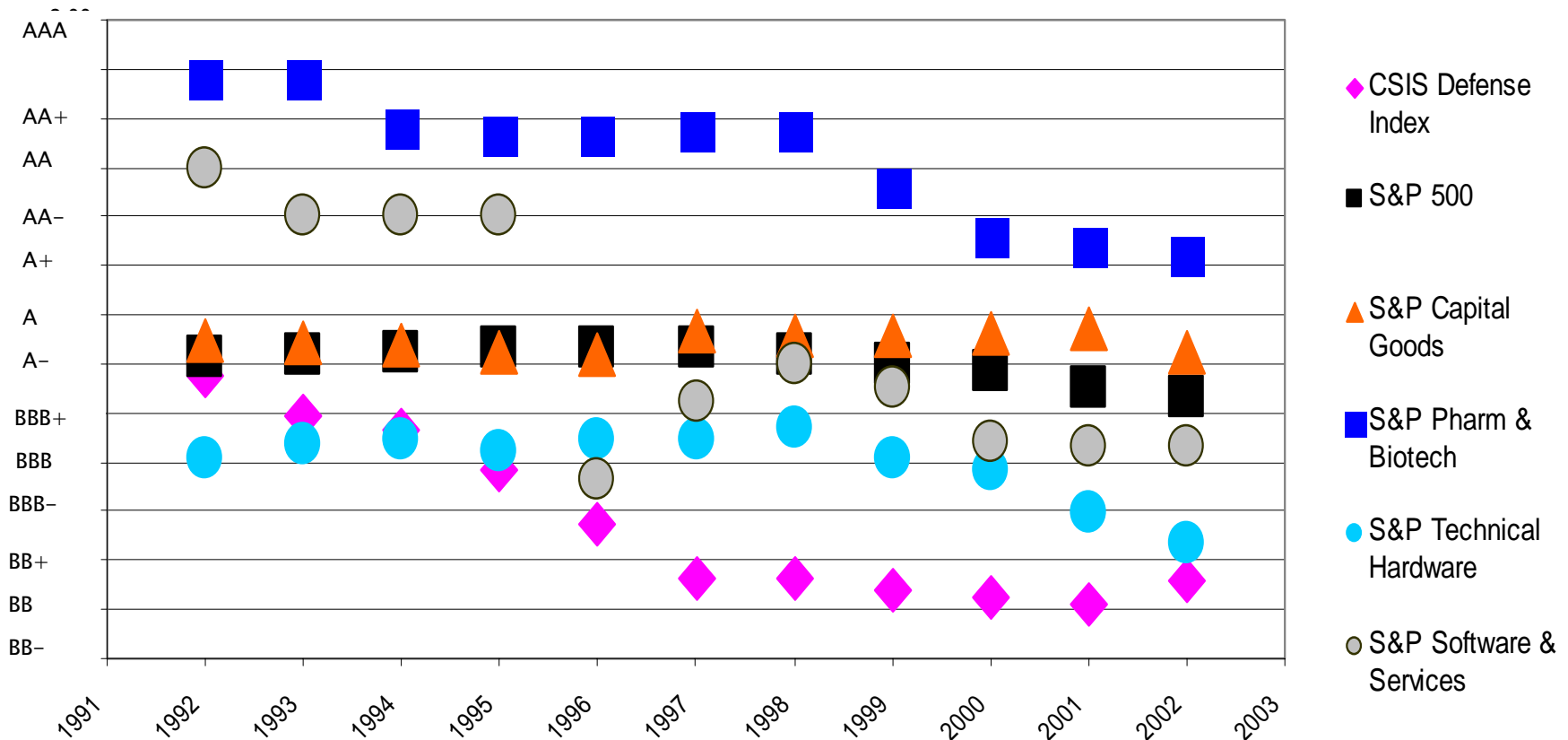
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Bond Markets Still Rate Industry Near “Junk”

Average Debt Ratings (unweighted)

(Preliminary Analysis)



Sources: FactSet, S&P Compustat, CSIS Analysis

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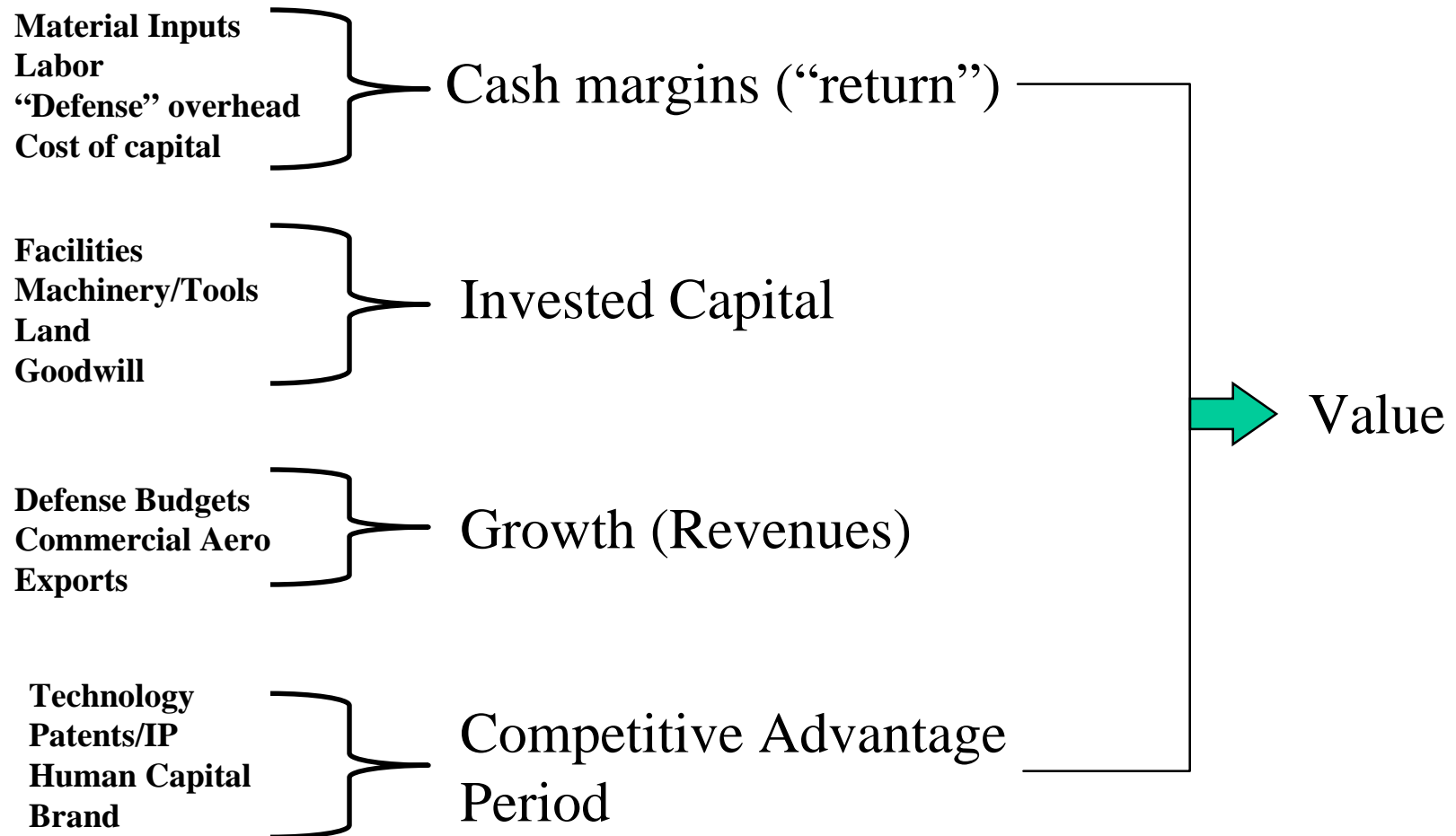
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Leveraging the Window of Opportunity

Four Key Components



Addressing Return/Margins

- ◆ Strategically
 - Exit non-core, underperforming businesses
 - Move to higher valued-added, more profitable areas - “System of systems” (which requires electronics/software expertise)

- ◆ Internally
 - Re-engineering efforts
 - Cost-reduction plans

- ◆ Government policy
 - Defense Science Board look at industry margin rates and ability to retain cost savings
 - Proposed changes to R&D margins, cost saving retentions

Addressing Return/Margins - Six Sigma

Three of Fortune's Top Ten Most Admired Corporations Uses Six Sigma
(three of the top four manufacturers)

- | | |
|----------------------------|---------------------------------|
| 1. Wal Mart | 6. Johnson & Johnson |
| 2. Southwest | 7. Microsoft |
| 3. Berkshire Hathaway | 8. FedEx |
| 4. Dell Computer | 9. Starbucks |
| 5. General Electric | 10. Proctor & Gamble |

Eight of Fortune's Top Ten Most Admired Aerospace/Defense Co's Uses Six Sigma

- | | |
|-------------------------------|---------------------|
| 1. United Technologies | 6. General Dynamics |
| 2. Lockheed Martin | 7. Textron |
| 3. Northrop Grumman | 8. Rockwell Collins |
| 4. Boeing | 9. Goodrich |
| 5. Honeywell | 10. Raytheon |



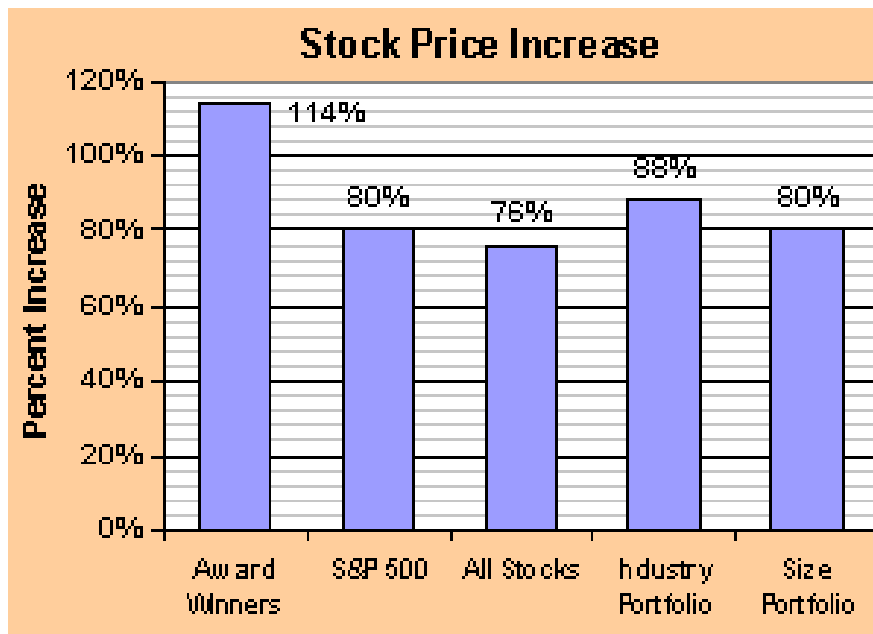
Addressing Return/Margins - Six Sigma

Can Generate Significant Savings

Motorola	1996-2001	\$16 billion	4.5% of revenues
Allied Signal	1998	\$500 million	9.9% of revenues
General Electric	1996-1999	\$4.4 billion	1.2% of revenues
Honeywell	1998-2000	\$1.8 billion	2.4% of revenues
Ford	2000-2002	\$1 billion	2.3% of revenues

Addressing Return/Margins - Six Sigma

And Can Be Rewarded by Wall Street



Malcolm Baldrige Award Winners	
Stock Perf vs. S&P	
1995	6.5 to 1
1996	4.0 to 1
1997	3.5 to 1
1998	2.9 to 1
1999	2.6 to 1
2000	4.9 to 1
2001	4.4 to 1

Addressing the Invested Capital Problems

- ◆ Strategically
 - Continued consolidation of the second and third tiers of the industry
 - Longer-term pressure for international consolidation

- ◆ Internally
 - Continue to eliminate excess facilities
 - Lean manufacturing efforts / recapitalization

- ◆ Government policy
 - Defense Science Board look at progress payments, paid cost rules
 - Pentagon changes to paid cost rules, progress payments

Addressing the Growth Problems

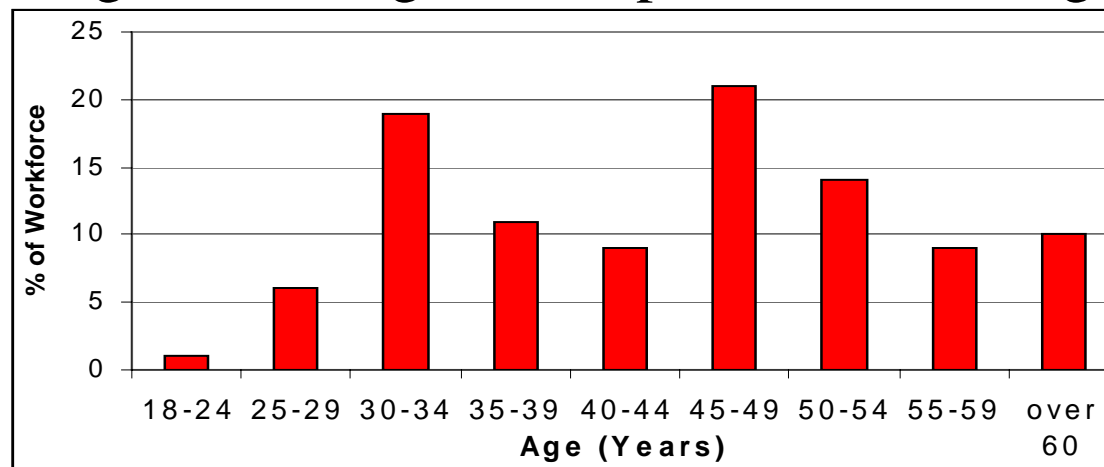
- ◆ Defense electronics/information systems faster growing part of the defense budget
 - As electronics-related budgets increase
 - As electronics/info systems become a greater portion of the weapon system

- ◆ “Vertical integration”

- ◆ Government policy
 - Mergers and acquisitions/competition rules

Addressing the Competitive Advantage Problems

- ◆ Strategically
 - Remain in high value-added areas - increasingly systems integration, software, information systems expertise
- ◆ Internally
 - Recruitment and retention of new talent (CRITICAL)
 - “Archiving” knowledge and expertise of existing talent



Source: Booz Allen & Hamilton