

Finance Theory II

(Corporate Finance)

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February 5, 2003

Today

- Preliminaries
- Introduction to the course
 - Corporate finance
 - Types of questions
 - Course outline
 - Course requirements
- Case of Unidentified Industries

Preliminaries

- Texts
 - Brealey & Myers, *Principles of Corporate Finance*, 7th edition
 - Higgins, *Analysis for Financial Management*, 7th edition
 - Case and Readings Packet
- Professor
 - Katharina Lewellen

Introduction

Corporate finance

- **Investment policy**
How the firm spends its money (real and financial assets)
- **Financing and payout policy**
How the firm obtains funds (debt, equity) and disposes of excess cash

Balance sheet view of the firm

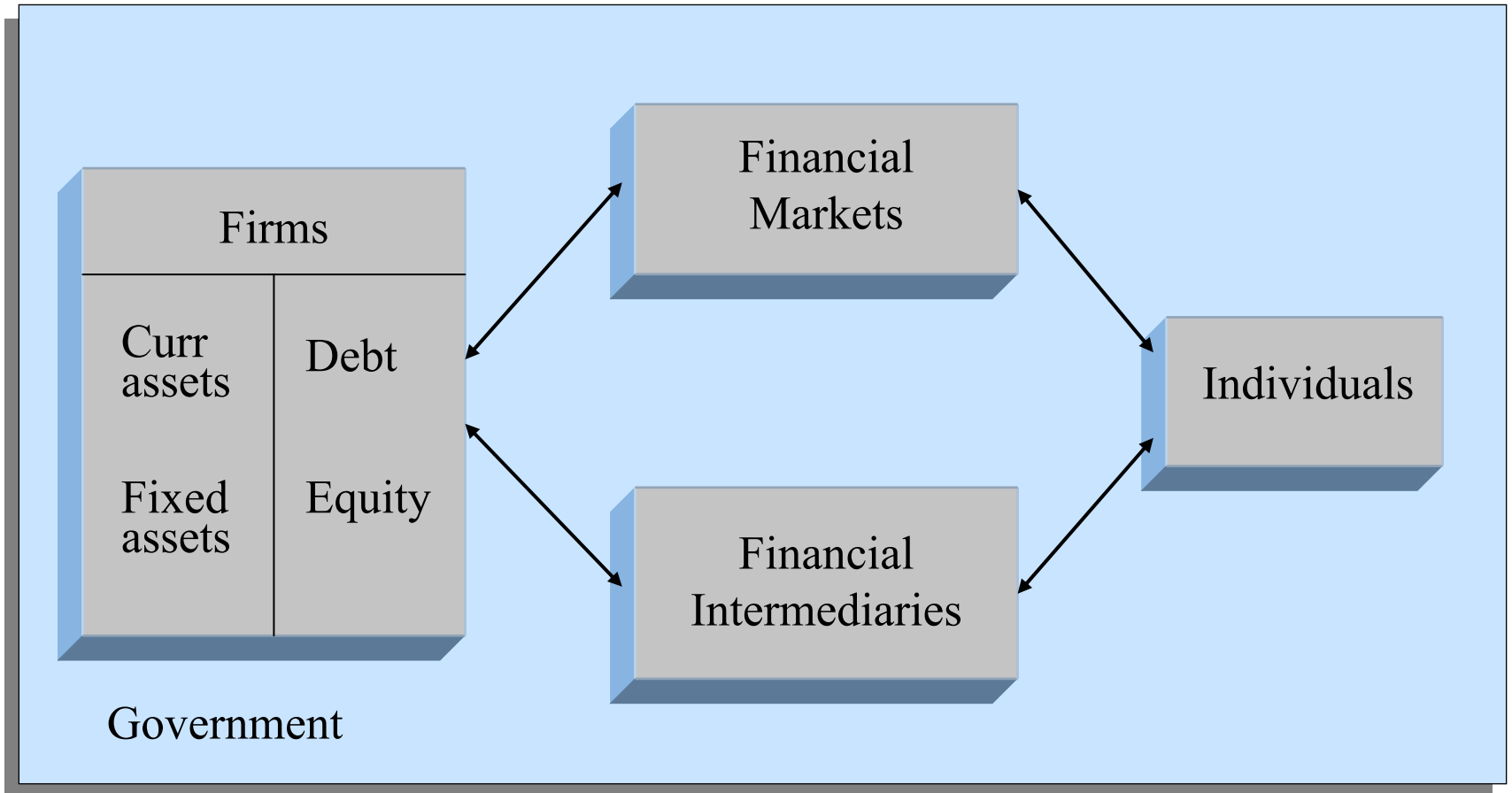
Assets	Liabilities
<p>Current Assets</p>	<p>Current Liabilities</p>
<p>Fixed Assets</p> <ol style="list-style-type: none">1. Tangible2. Intangible	<p>Long-term debt</p>
	<p>Shareholders' Equity</p>

Introduction, cont.

But we also need to understand...

- **Capital markets**
 - Types of securities (stocks, bonds, options...)
 - Trade-off between risk and return
 - Pricing
- **Taxes and government regulation**

Financial markets



Introduction, cont.

Finance is really about *value*

- Firms
- Projects and real investments
- Securities

Common characteristic

- Invest cash today in exchange for cash (hopefully) in the future

Central question

- How do we create value through investment and financing decisions?

Types of questions

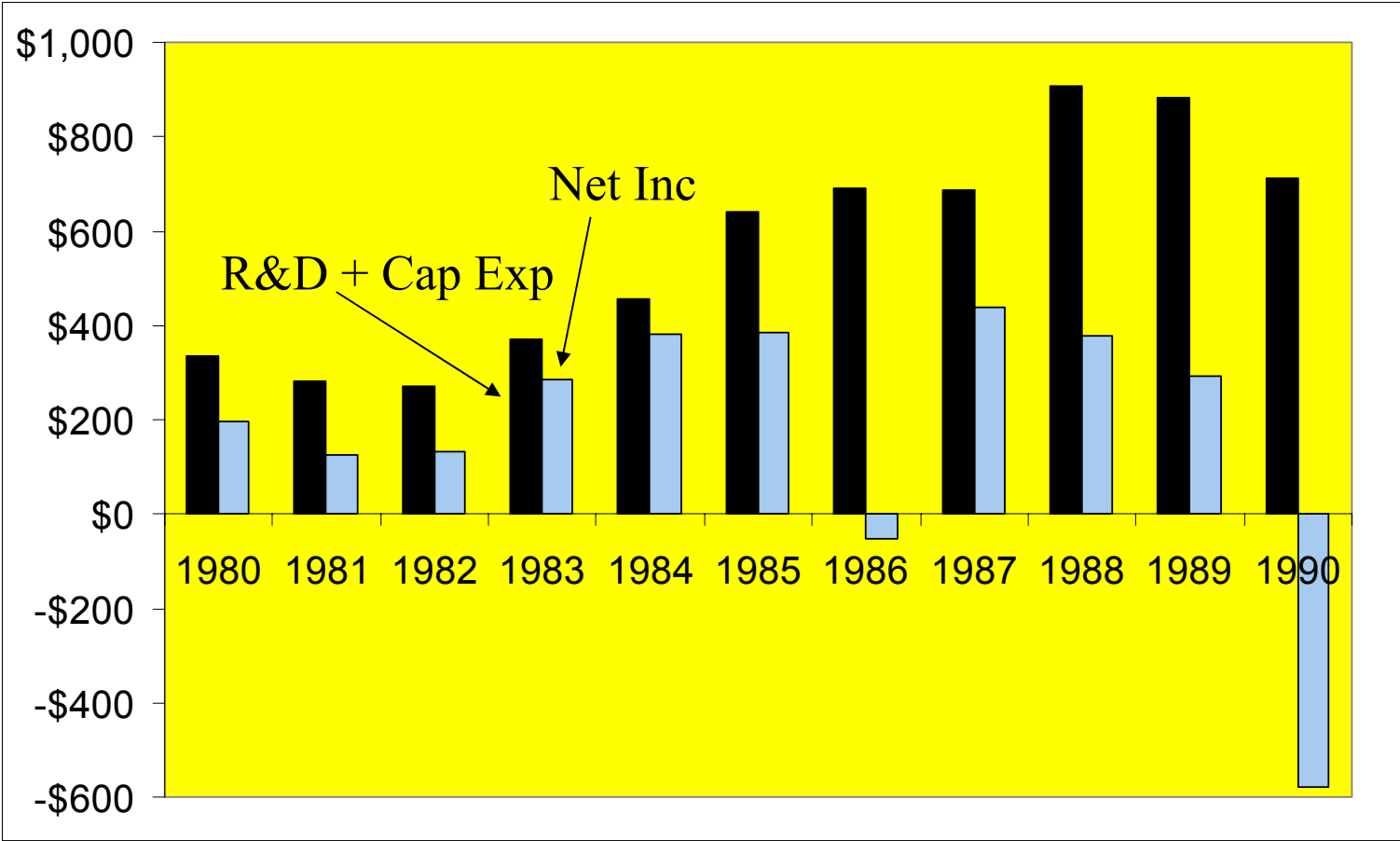
Investment and financing decisions

- At the end of 1999, GM had \$11.4 billion in cash.
 - Should it invest in new projects or return the cash to shareholders?
 - If it decides to return the cash, should it declare a dividend or repurchase stock?
 - If it decides to invest, what is the most valuable investment? What are the risks?

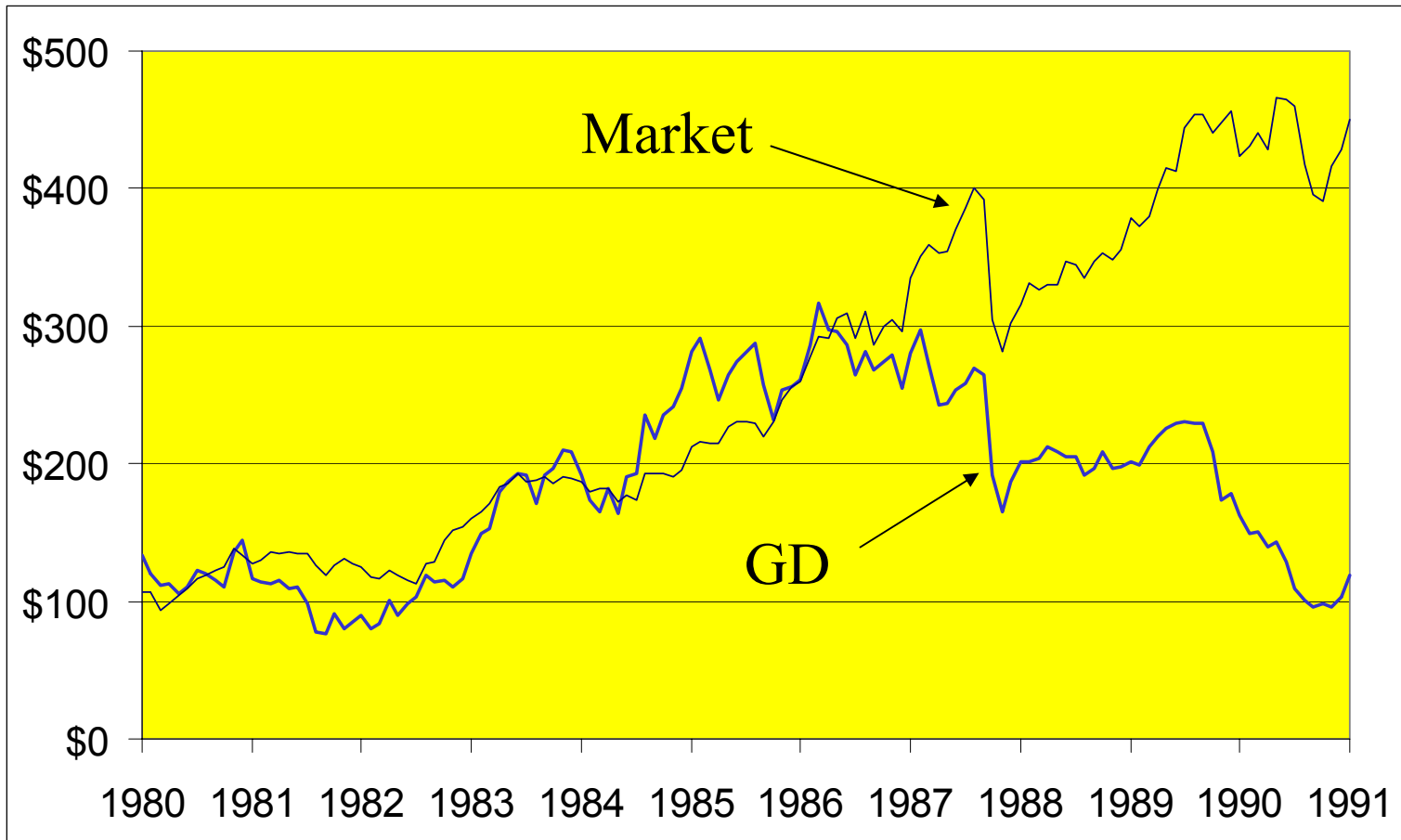
General Dynamic

- Major contractor in the defense industry
- Doing well during 1980s (cold war)
 - Growth in sales
 - Reasonable profitability
 - R&D and capital investment
- Beginning of 1990s
 - The end of cold war
 - Likely decline in defense spending
 - Strategy???

General Dynamics



Value of \$100 invested in Jan. '80



General Dynamics

Investment, 1980 – 1990

R&D + Capital expenditures:	\$3.7 billion
If invested at 10%:	\$5.5 billion
Ending market value:	\$1.0 billion

Value destroyed: \$4.5 billion

Sales grew from \$4.7 billion to \$10.2 billion

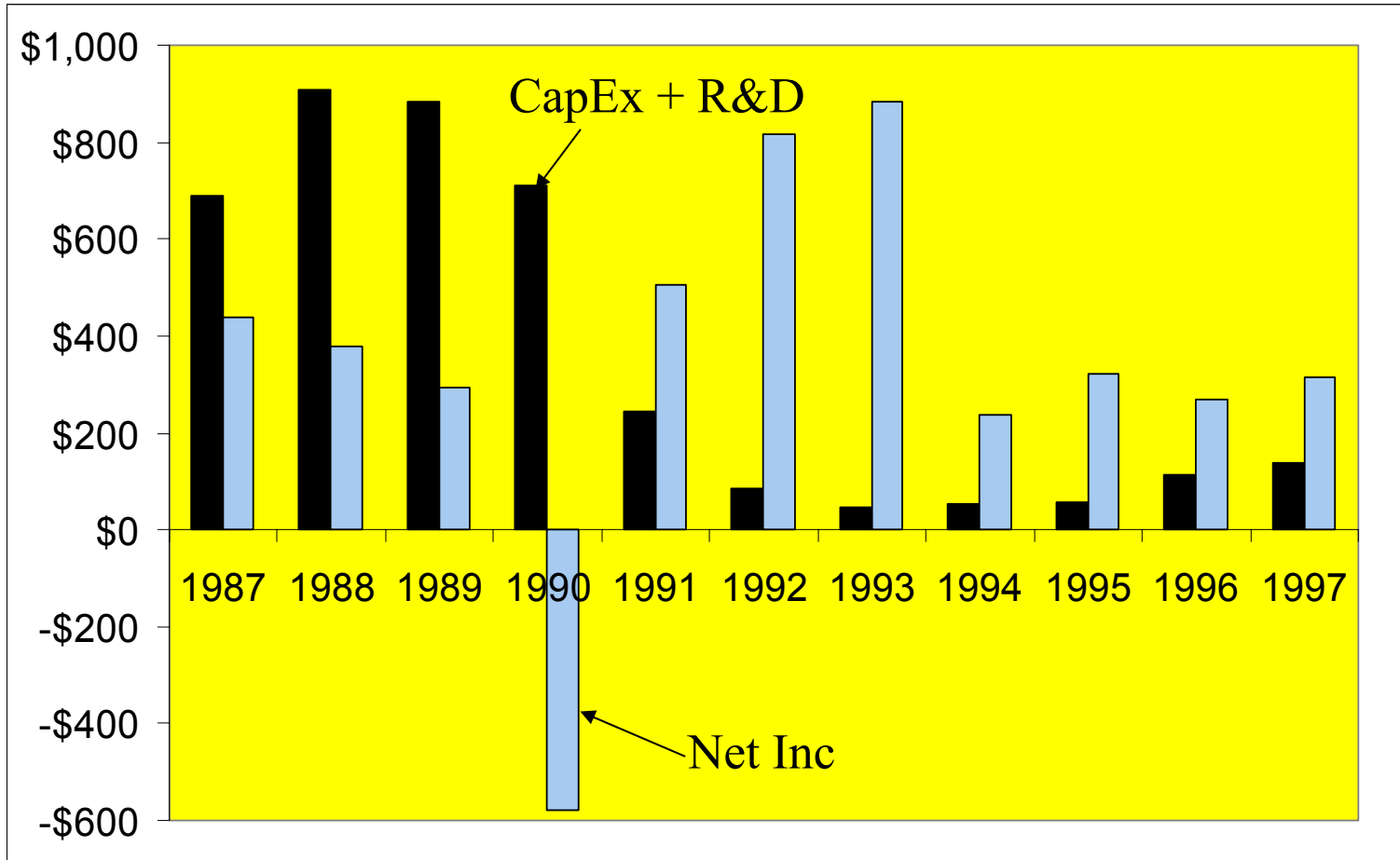
Earnings in 1990 = -578 million

New strategy in 1991

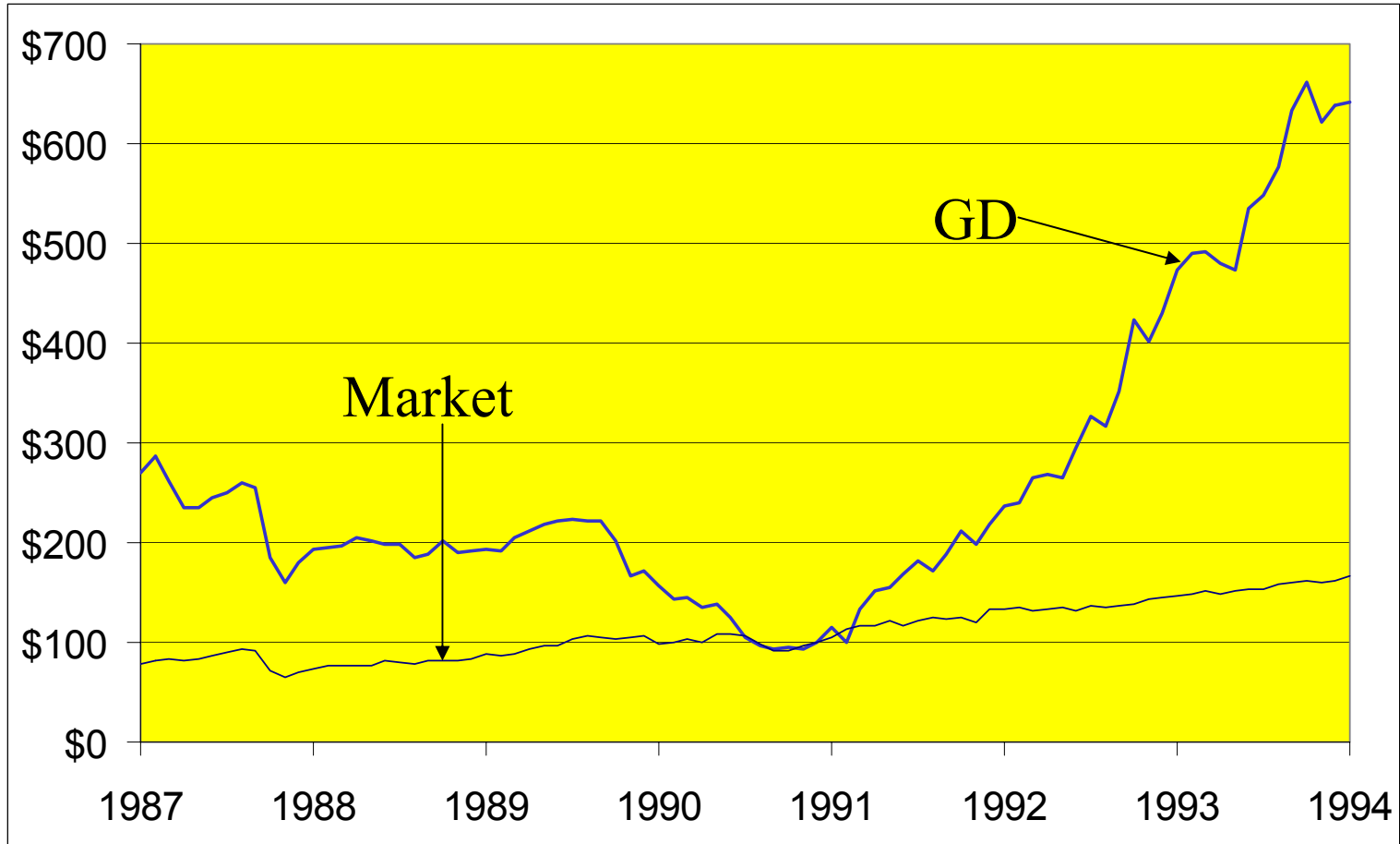
William A. Anders (new CEO):

- Cuts capital expenditure and R&D
 - Cap. Exp. drops from \$321 million in 1990 to \$81 million in 1991
- Sells off divisions and subsidiaries
- Cuts workforce
- Distributes cash to shareholders
 - From 1991 through 1993, GD returns \$3.4 billion to shareholders and debtholders

General Dynamics: 1987 – 1997



Value of \$100 invested Jan. '91



Types of questions

Investment and financing decisions

- Your firm needs to raise capital to finance growth.
 - Should you issue debt or equity or obtain a bank loan?
 - How will the stock market react to your decision?
 - If you choose debt, should the bonds be convertible? callable? Long or short maturity?
 - If you choose equity, what are the trade-offs between common and preferred stock?

Types of questions, cont.

Investment and financing decisions

- IBM recently announced that it would repurchase \$2.5 billion in stock. Its price jumped 7% after the announcement. Why? How would the market have reacted if IBM increased dividends instead? Suppose Intel made the same announcement. Would we expect the same price response?
- Motorola wants to build a new chip factory in Ireland. How will fluctuations in the foreign exchange rate affect the value of the project? What are the risks? What actions can Motorola take to hedge the risks? More importantly, *should* it hedge the risks? What are the costs and benefits?

Our Approach

What we will do

- Acquire a set of general tools that are crucial to sound business decision
 - Financial managers
 - General managers
- Apply and confront them to a number of real business cases
 - Usefulness
 - Limitations

What we won't do

- Pretend to be experts in any industry, financial or other
- Discuss many institutional aspects in detail
- Discuss in detail stuff you could learn just as well reading a book or an article (see “readings”)

Outline: Theory + Applications

- **Part I: Financing**
 - Capital structure
 - Payout policy

- **Part II: Valuation**
 - Project valuation (FCF, PV, Real Options)
 - Company valuation (M&A, Start-ups)

- **Part III: Selected topics in corporate finance**
 - Corporate governance
 - Hedging/Risk management

The tools of finance (15.401)

- Time Value of Money
- Portfolio Theory
- Asset Pricing Theory
- Efficient Markets Hypothesis
- Option Pricing Theory
- The Concept of No-Arbitrage
- Agency Theory (Micro-economics, Incentives and Contracts)

Course Requirements

- Class Participation (10%)
- Case Memoranda (30%)
 - Teams up to four people
 - Hand in all write-ups except two write-ups of your choice
 - A professional memo to the decision maker
- Midterm (30%)
- Final (30%)

The Case of the Unidentified Industries

Advertising Agency
 Computer Software Developer
 Health Maintenance Org.
 Retail Drug Chain

Airline
 Department Store Chain
 Meat Packer
 Retail Grocery Chain

Commercial Bank
 Electric & Gas Utility
 Pharmaceutical Manufacturer

Line		A	B	C	D	E	F	G	H	I	J	K
	Balance Sheet Percentages											
#1	Cash and marketable securities	5	12	2	1	4	4	3	77	9	67	19
2	Account receivables	85	55	4	15	7	6	4	7	28	9	13
3	Inventories	0	0	1	24	43	0	22	0	13	2	12
4	Other current assets	1	4	2	2	4	6	2	3	3	2	6
5	Plant and equipment (net)	2	7	77	55	37	71	41	9	35	17	48
6	Other assets	7	23	15	3	5	13	29	4	13	2	1
7	Total assets	100	100	100	100	100	100	100	100	100	100	100
8	Notes payable	62	3	0	2	0	4	2	0	0	0	7
9	Accounts payable	18	63	3	17	18	5	13	32	15	6	5
10	Accrued taxes	2	2	0	1	1	0	1	3	6	6	2
11	Other current liabilities	0	0	4	9	17	17	12	2	13	5	8
12	Long-term debt	7	6	29	38	0	40	29	0	19	0	15
13	Preferred stock	4	8	21	5	10	17	14	1	6	0	1
14	Other liabilities	2	0	5	3	0	0	0	0	0	0	0
15	Capital stock and capital surplus	2	10	11	1	3	12	5	11	24	28	16
16	Retained earnings	4	7	28	23	51	5	24	51	18	55	46
17	Total liabilities and stockholder equity	100	100	100	100	100	100	100	100	100	100	100
	Selected Financial Data											
18	Current assets/current liabilities	1.11	1.03	1.31	1.46	1.59	0.63	1.1	2.35	1.58	4.72	2.31
19	Cash, marketable securities and accounts receivable/current liabilities	1.1	0.97	0.98	1.4	1.49	0.4	1.04	2.28	1.5	4.59	2.03
20	Inventory turnover (X)	NA	NA	16.7	5.6	5.2	NA	8.6	NA	47.6	7.5	2
21	Receivables collection period	3,278	381	30	31	8	27	6	13	16	37	74
22	Total debt/total assets	0.69	0.10	0.29	0.40	0.00	0.44	0.31	0.00	0.19	0.00	0.22
23	Long-term debt/capitalization	0.09	0.24	0.40	0.57	0.00	0.66	0.48	0.00	0.32	0.00	0.18
24	Net sales/total assets	0.10	0.52	0.46	1.82	3.18	0.83	2.61	2.03	6.47	0.87	0.64
25	Net profit/net sales	0.14	0.05	0.12	0.02	0.03	0.01	0.02	0.13	0.02	0.25	0.11
26	Net profit/total assets	0.01	0.03	0.05	0.04	0.10	0.01	0.05	0.27	0.10	0.21	0.07
27	Total assets/net worth	14.10	5.84	2.31	3.61	1.85	5.77	3.43	1.62	2.39	1.21	1.61
28	Net profit/net worth	0.19	0.14	0.12	0.13	0.18	0.07	0.17	0.43	0.23	0.26	0.11

Industry Groups

Service providers

- Advertising agency
- Airline
- Commercial bank
- HMO

Zero inventories

- A, B, F, H

Group 1:

- Advertising Agency
- Airline
- Commercial Bank
- HMO

		A	B	F	H
Line	Balance Sheet Percentages				
#1	Cash and marketable securities	5	12	4	77
2	Account receivables	85	55	6	7
3	Inventories	0	0	0	0
4	Other current assets	1	4	6	3
5	Plant and equipment (net)	2	7	71	9
6	Other assets	7	23	13	4
7	Total assets	100	100	100	100
8	Notes payable	62	3	4	0
9	Accounts payable	18	63	5	32
10	Accrued taxes	2	2	0	3
11	Other current liabilities	0	0	17	2
12	Long-term debt	7	6	40	0
13	Preferred stock	4	8	17	1
14	Other liabilities	2	0	0	0
15	Capital stock and capital surplus	2	10	12	11
16	Retained earnings	4	7	5	51
17	Total liabilities and stockholder equity	100	100	100	100
	Selected Financial Data				
18	Current assets/current liabilities	1.11	1.03	0.63	2.35
19	Cash, marketable securities and accounts receivable/current liabilities	1.1	0.97	0.4	2.28
20	Inventory turnover (X)	NA	NA	NA	NA
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25	Net profit/net sales	0.14	0.05	0.01	0.13
26	Net profit/total assets	0.01	0.03	0.01	0.27
27	Total assets/net worth	14.10	5.84	5.77	1.62

Identified Industries in Group 1

- A Commercial Bank
- B Advertising Agency
- F Airline
- H Health Maintenance Organization (H.M.O.)

Group 2

■ Computer software dev.

■ Dept. store

■ Electric & gas utility

■ Meat packer

■ Pharmaceutical manufacturer

■ Retail drug

■ Retail grocery

		C	D	E	G	I	J
Line	Balance Sheet Percentages						
#1	Cash and marketable securities	2	1	4	3	9	67
2	Account receivables	4	15	7	4	28	9
3	Inventories	1	24	43	22	13	2
4	Other current assets	2	2	4	2	3	2
5	Plant and equipment (net)	77	55	37	41	35	17
6	Other assets	15	3	5	29	13	2
7	Total assets	100	100	100	100	100	100
8	Notes payable	0	2	0	2	0	0
9	Accounts payable	3	17	18	13	15	6
10	Accrued taxes	0	1	1	1	6	6
11	Other current liabilities	4	9	17	12	13	5
12	Long-term debt	29	38	0	29	19	0
13	Preferred stock	21	5	10	14	6	0
14	Other liabilities	5	3	0	0	0	0
15	Capital stock and capital surplus	11	1	3	5	24	28
16	Retained earnings	28	23	51	24	18	55
17	Total liabilities and stockholder equity	100	100	100	100	100	100
	Selected Financial Data						
18	Current assets/current liabilities	1.31	1.46	1.59	1.1	1.58	4.72
19	Cash, marketable securities and accounts receivable/current liabilities	0.98	1.4	1.49	1.04	1.5	4.59
20	Inventory turnover (X)	16.7	5.6	5.2	8.6	47.6	7.5
21	Receivables collection period	30	31	8	6	16	37
22	Total debt/total assets	0.29	0.40	0.00	0.31	0.19	0.00
23	Long-term debt/capitalization	0.40	0.57	0.00	0.48	0.32	0.00
24	Net sales/total assets	0.46	1.82	3.18	2.61	6.47	0.87
25	Net profit/net sales	0.12	0.02	0.03	0.02	0.02	0.25
26	Net profit/total assets	0.05	0.04	0.10	0.05	0.10	0.21
27	Total assets/net worth	2.31	3.61	1.85	3.43	2.39	1.21
28	Net profit/net worth	0.12	0.13	0.18	0.17	0.23	0.26

Group 2: Inventory turnover

- Computer software dev.
- Dept. store
- Electric & gas utility
- Meat packer
- Pharmaceutical manufacturer
- Retail drug
- Retail grocery

Industry	Inventory turnover
I	47.6
C	16.7
G	8.6
J	7.5
D	5.6
E	5.2
K	2.0

Group 2: Receivables collection period

- Computer software dev.
- Dept. store
- Pharmaceutical manufacturer
- Retail drug
- Retail grocery

Industry	Collection period
K	74
J	37
D	31
E	8
G	6

Group 2: Inventory & PPE

- Computer software dev.
- Dept. store
- Pharmaceutical manufacturer

Industry	INV (%)	PPE (%)
D	24	55
K	12	48
J	2	17

The Identified Industries

A	Commercial Bank	Citicorp
B	Advertising Agency	Interpublic
C	Electric & Gas Utility	Consolidated Edison
D	Department Store Chain	Dayton-Hudson
E	Retail Drug Chain	Walgreen
F	Airline	AMR Corp.
G	Retail Grocery Chain	American Stores
H	H.M.O.	U.S. Healthcare
I	Meat Packers	IBP, Inc.
J	Software Developer	Microsoft
K	Pharmaceutical Manuf.	Novo Nordisk

Any Comments?

		Bank	Advertising Agency	E & G Utility	Dpt Store Chain	Drug Chain	Airline	Grocery Chain	HMO	Meat Packers	Software Developer	Phama. Manuf.
Line	Balance Sheet Percentages											
#1	Cash and marketable securities	5	12	2	1	4	4	3	77	9	67	19
2	Account receivables	85	55	4	15	7	6	4	7	28	9	13
3	Inventories	0	0	1	24	43	0	22	0	13	2	12
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13	Preferred stock	4	8	21	5	10	17	14	1	6	0	1
14	Other liabilities	2	0	5	3	0	0	0	0	0	0	0
15	Capital stock and capital surplus	2	10	11	1	3	12	5	11	24	28	16
16	Retained earnings	4	7	28	23	51	5	24	51	18	55	46
17	Total liabilities and stockholder	100	100	100	100	100	100	100	100	100	100	100
	Selected Financial Data											
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22	Total debt/total assets	0.69	0.1	0.29	0.4	0	0.44	0.31	0	0.19	0	0.22
23	Long-term debt/capitalization	0.09	0.24	0.4	0.57	0	0.66	0.48	0	0.32	0	0.18
24	Net sales/total assets	0.095	0.523	0.464	1.822	3.175	0.828	2.61	2.032	6.473	0.867	0.643

Leverage

	Industry	Firm	Total Debt/Total Asset		
			Industry Mean	Industry Std Dev	Industry Median
American Airlines	Airlines	0.44	0.32	0.20	0.31
Dayton Hudson	Department Stores	0.40	0.29	0.17	0.30
American Stores	Grocery Stores	0.31	0.35	0.20	0.32
Consolidated Edison	Combination Utility Services	0.29	0.35	0.05	0.35
Novo Nordisk	Pharmaceuticals	0.22	0.24	0.92	0.08
IBP	Meat Products	0.19	0.31	0.24	0.30
Interpublic	Advertising Agencies	0.10	0.08	0.06	0.09
Walgreens	Drug Stores	0.00	0.24	0.18	0.27
Microsoft	Prepackaged Software	0.00	0.07	0.19	0.01
US Healthcare	HMOs	0.00	0.09	0.11	0.04

	Firm A	Firm B
Balance Sheet	%	%
Cash and marketable securities	58	2
Accounts receivable	0	3
Inventories	5	52
Other current assets	3	3
Plant and equipment (net)	5	28
Other assets	30	12
Total assets	100	100
Notes payable	0	0
Accounts payable	17	28
Accrued taxes	0	2
Other current liabilities	7	15
Long-term debt	54	14
Other liabilities	0	4
Preferred stock	0	0
Capital stock and capital surplus	47	29
Retained earnings	(25)	9
Total liabilities and stockholder equity	100	100