

# Different Incentives in Government Contracting

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# Outline

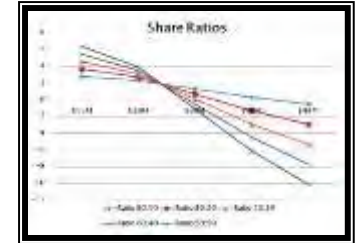
- ▶ Introduction
- ▶ Incentive Fee Contracts
- ▶ Principal–Agent Problem
- ▶ Stock Pricing Theory
- ▶ Case Study 1: Public Sector
- ▶ Case Study 2: Private Sector
- ▶ Alternate Contract Incentives
- ▶ Conclusions

# Introduction

- ▶ Government Spending
  - Discretionary spending is decreasing to its lowest level since just after World War II
  - Non-Discretionary spending is on a projected path to increase from 10% to 16% of GDP by 2031
- ▶ Cost overruns negatively impact discretionary funding

# Incentive Fee Contracts

## Overview



- ▶ Initially seen as a way to ensure that the government did not waste money on cost overruns so funds could be available to pursue as many projects as possible
- ▶ Key Principle:
  - Share the risk between the Government and Contractor through the contract's fee structure
- ▶ Types of Contracts

Cost Reimbursable	Fixed Cost
Cost Plus Fixed Fee (CPFF)	Firm Fixed Price (FFP)
Cost Plus Incentive Fee (CPIF)	Firm Price Incentive Fee (FPIF)

# Incentive Fee Contracts Effective?



- ▶ Cost Overruns are still prevalent in government contracting

Program	Department/ Agency	Estimated Cost	Year of Estimate	Actual (or recent estimate)	Year of Actual	Percent Overrun
F/A-22 Raptor	Defense	\$117M	1992	\$254M	2002	117%
V-22 Osprey	Defense	\$36M	1987	\$93M	2001	158%
Patriot Advanced Missiles	Defense	\$5M	1995	\$10M	2002	100%
Denver International Airport	Transportation	\$1.7B	1989	\$4.8B	1995	182%
FBI Trilogy Computer System	Justice	\$477M	2000	\$600M	2004	26%
International Space Station	NASA	\$17B	1995	\$30B	2002	76%

# Principal-Agent Problem

## Definition

- ▶ Misalignment of goals between the principal (firm) and the agent (executives)
- ▶ Wage contracts used to align the incentives of the agent to match the firm's incentives
  - Present Solution: Stock compensation
- ▶ Can the “stock solution” be applied by the government (customer) to motivate their contractors?

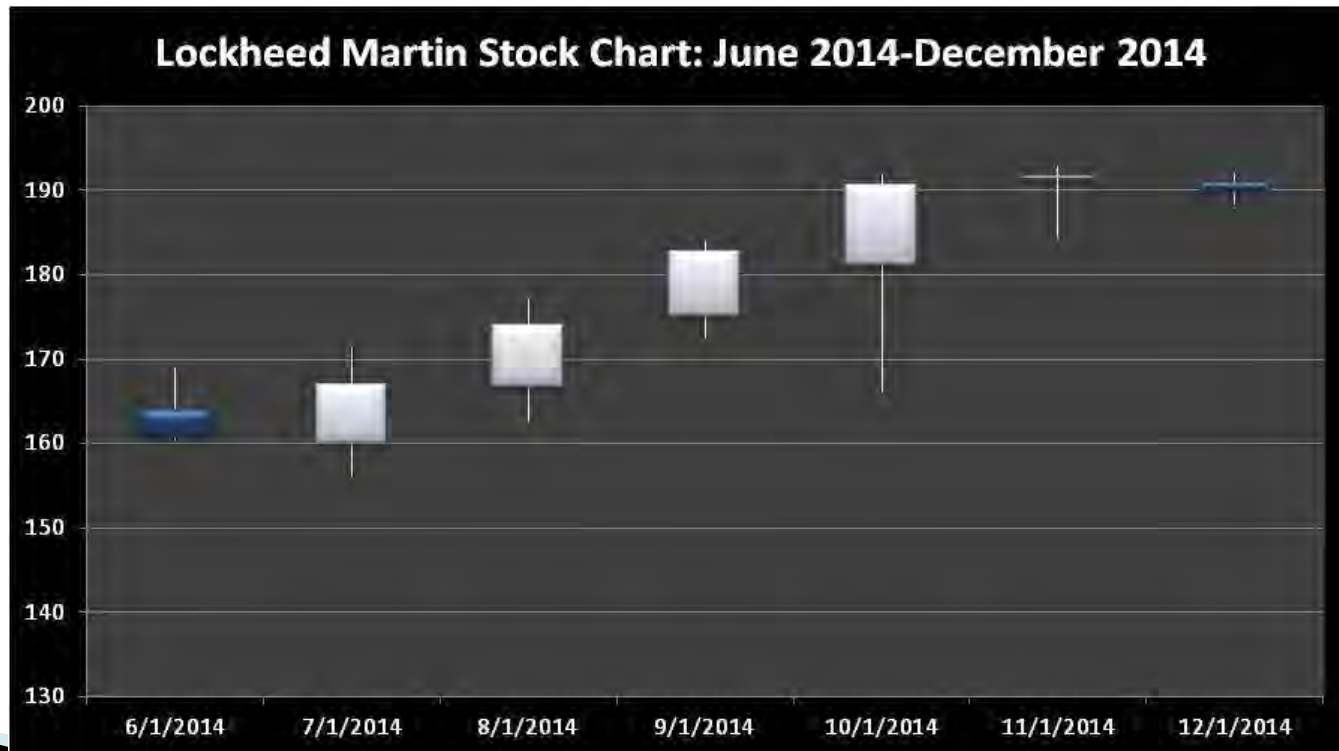
# Stock Pricing Theory

- ▶ In general, stocks fluctuate due to market forces
  - Analysts base the expected future value of a company on their earnings projects
- ▶ Dividend Discount Model
  - The stock price is equal to the present value of its future stream of dividends

$$\text{Stock Price} = D / (I - G)$$

# Case Study 1: Public Sector

- ▶ Program: Joint Strike Fighter (JSF)
- ▶ Contractor: Lockheed Martin
- ▶ Customer Signal
  - September 2014: GAO Report questioning JSF sustainability

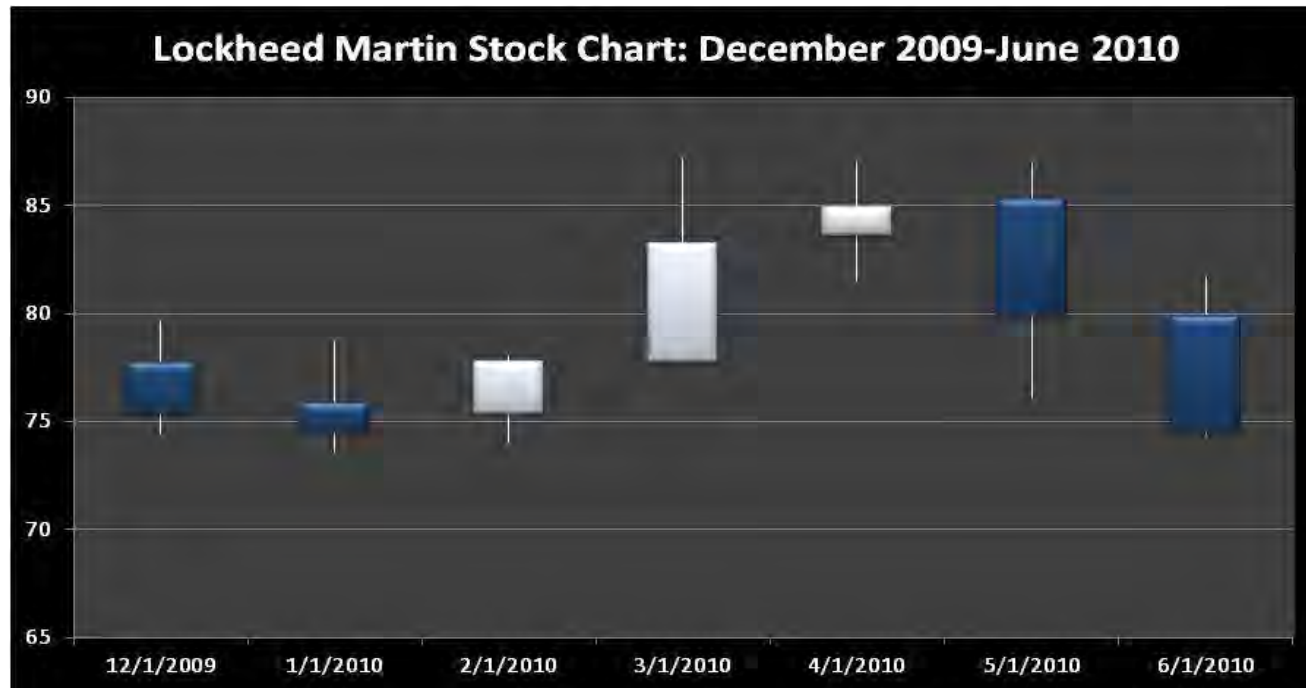




# Case Study 1: Public Sector

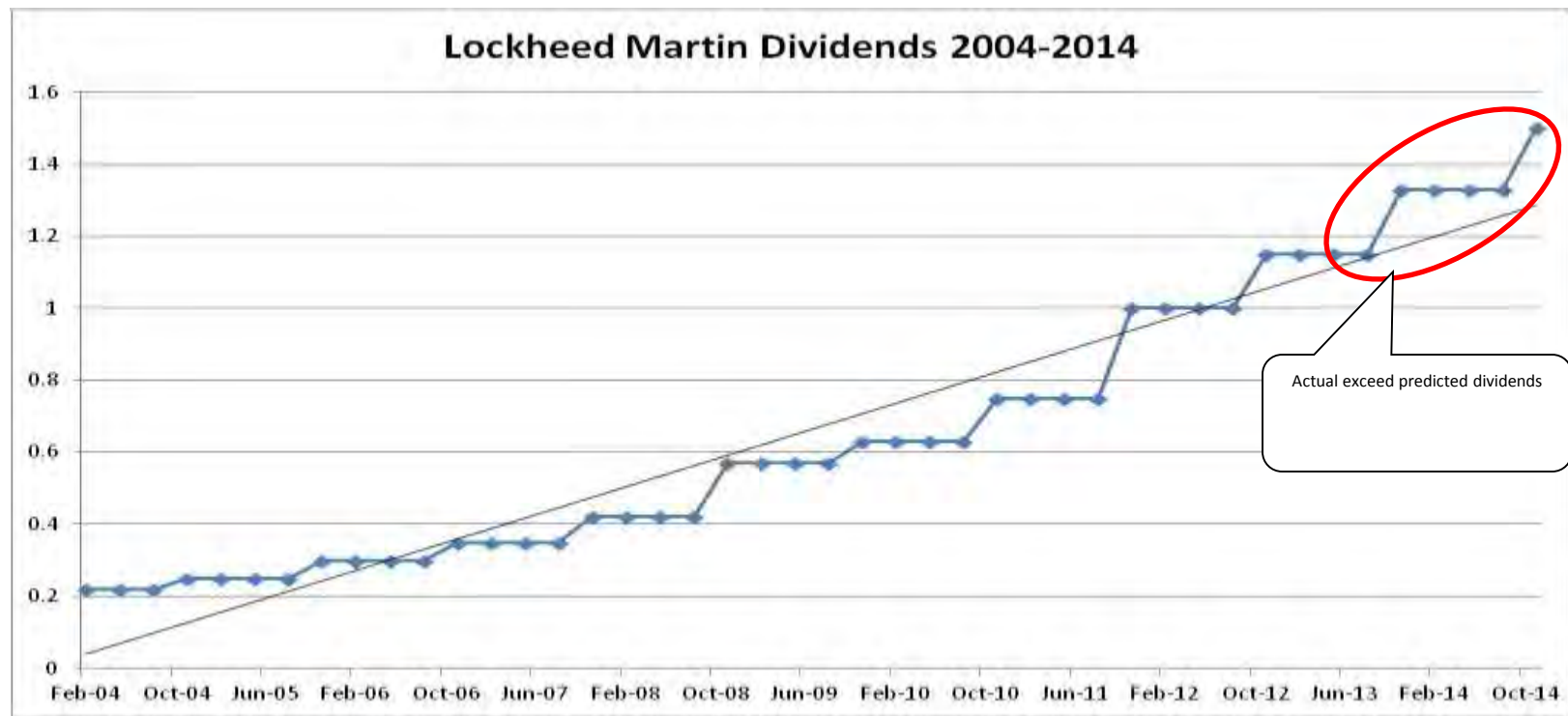
## Different Signal

- ▶ Program: JSF
- ▶ Contractor: Lockheed Martin
- ▶ Stronger Customer Signal?
  - March 2010: Nunn-McCurdy Breach



# Lockheed Martin Dividend Pay Outs

- ▶ Lockheed's dividend payouts are constantly increasing over time (2004-2014)



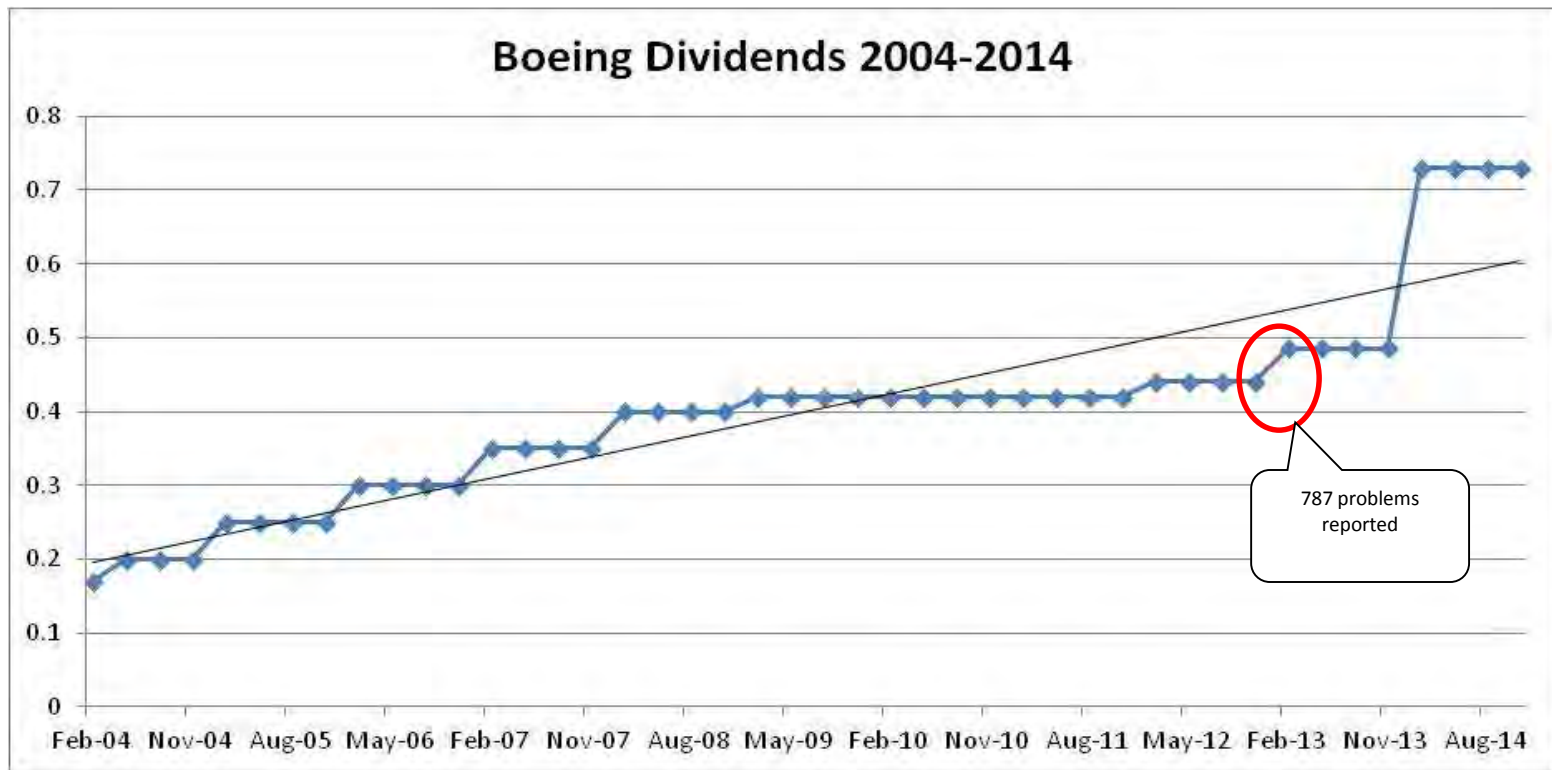
# Case Study 2: Private Sector

- ▶ Program: Dreamliner 787
- ▶ Contractor: Boeing
- ▶ Customer Signal
  - January 2013: 787 Dreamliner grounded due to a series of technical failures



# Boeing Dividend Pay Outs

- ▶ Boeing's dividends saw a larger than expected increase in 2014



# Alternate Contract Incentives

- ▶ Stock prices do not adequately capture customer signals and are ineffective to incentivize the agent (executives) or the principal (firm)
- ▶ Future revenue streams seem to be the primary focus of stock price
  - How can the customer use future revenues to influence the principal and/or agent?
    - Example: FADS Contract
    - Remaining challenges: alternate streams of revenue

# Conclusion

- ▶ Many competing incentives in contracts
- ▶ Stock compensation is an ineffective method for customer signals to influence stock price and thus motivate executives
- ▶ Other methods to align incentives
  - Credible threat to cancellation
  - Align executive pay with customer feedback
  - Use innovative short term contracts to create competition
- ▶ Future Research
  - Ratio of public vs. private sector revenue streams for companies
  - Real impact of program cancellation as a credible threat



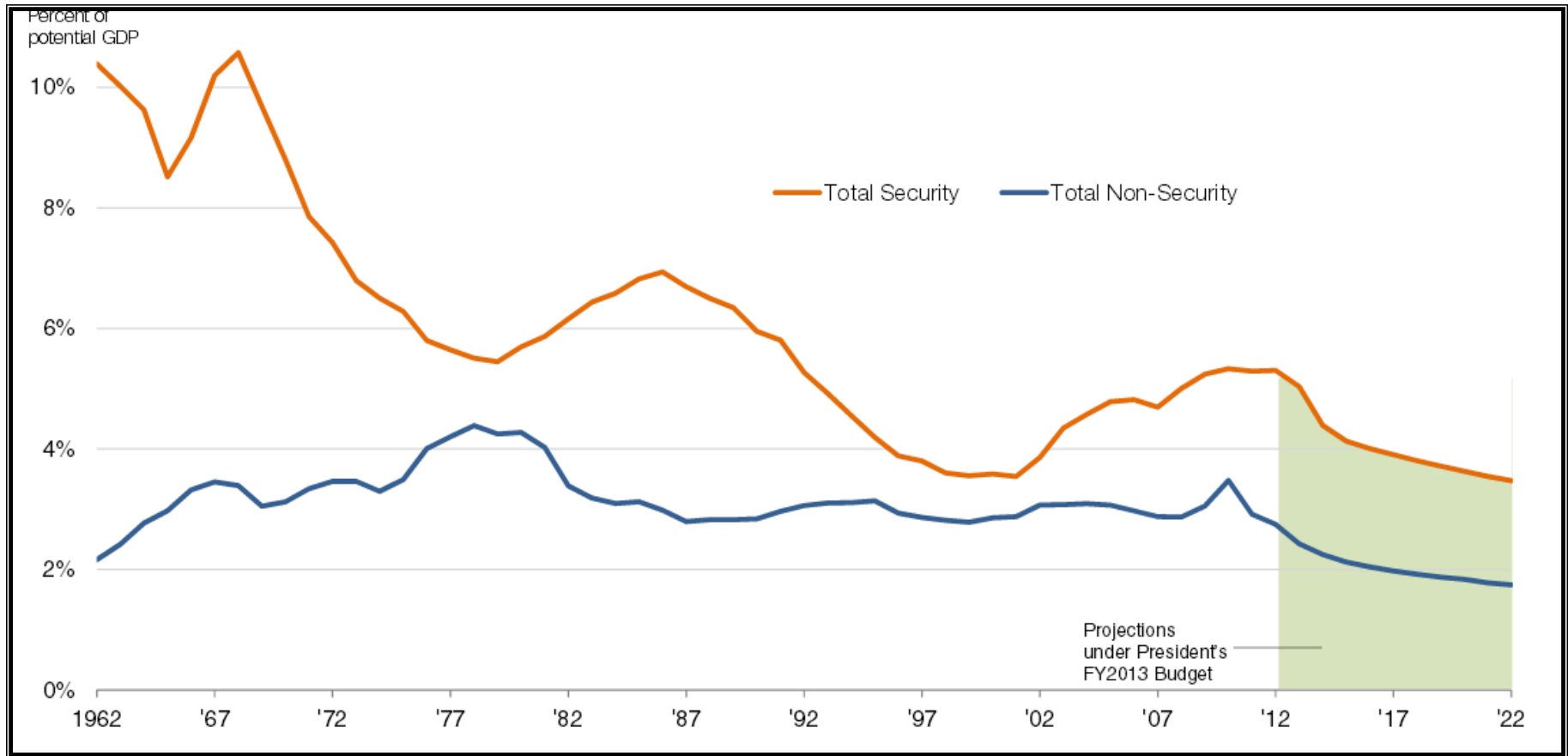


Questions?

# Back-up

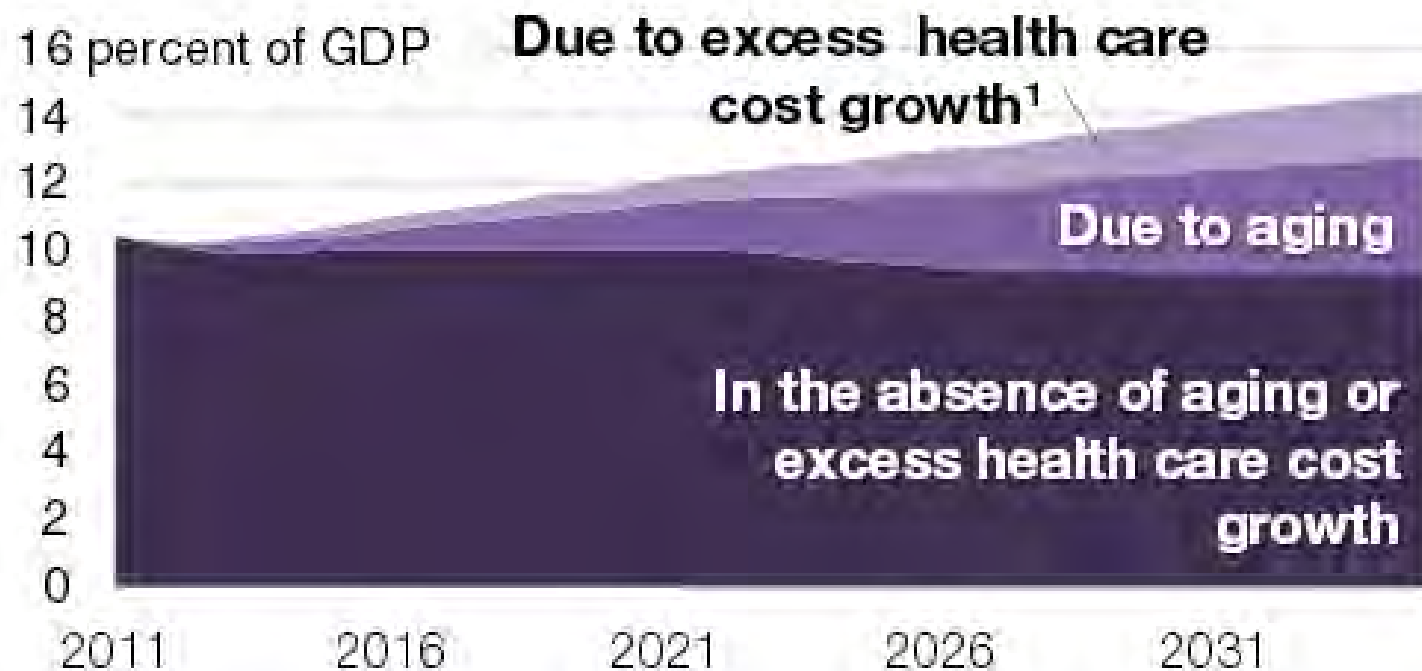


# Discretionary Spending



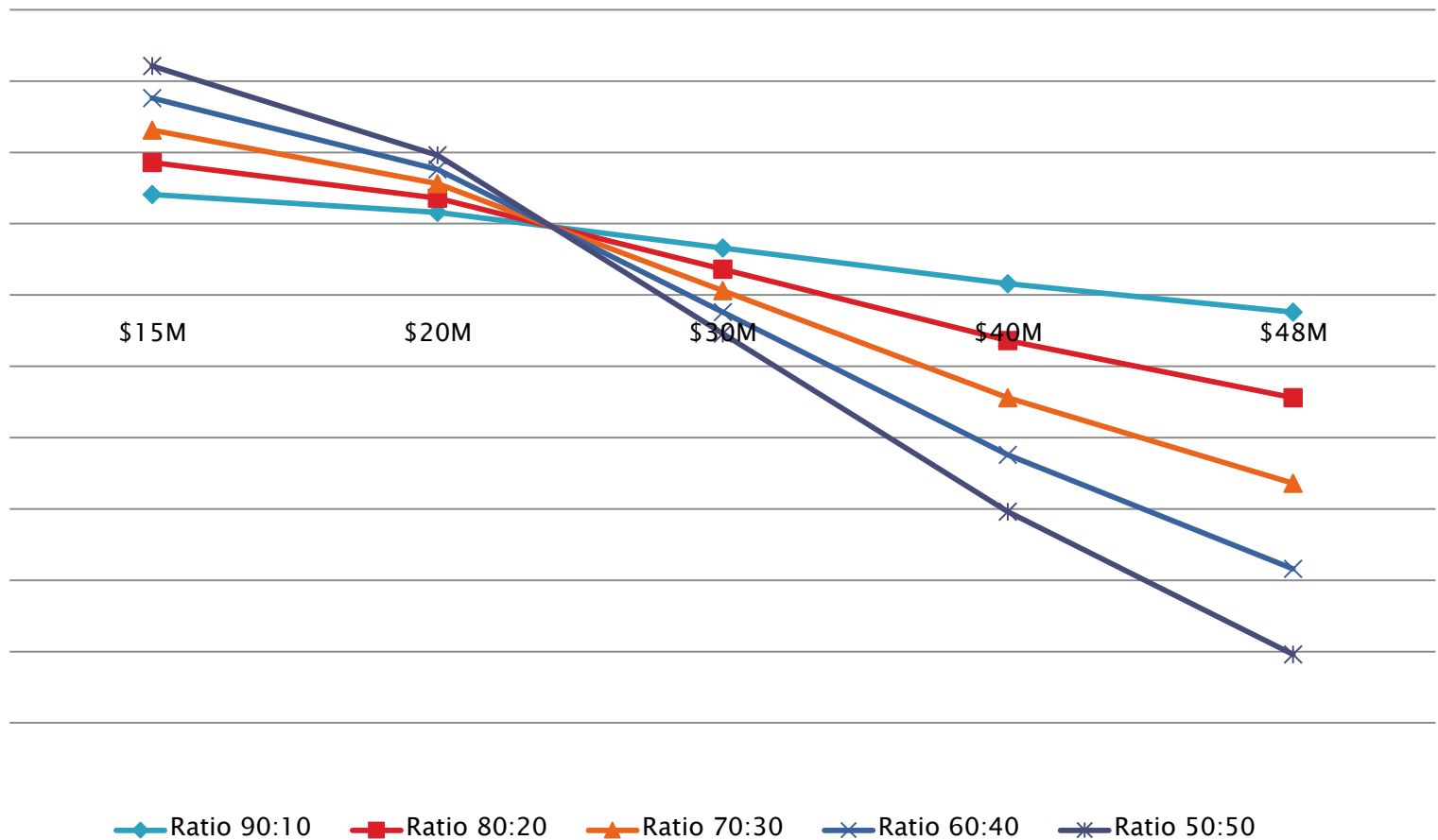
# Non-Discretionary Spending

Sources of projected federal spending on major mandatory health care programs and Social Security, 2011 to 2035.



# Share Ratio Graph

## Share Ratios



# Share Ratio Equations

- ▶ Payout for Incentive Fee Contracts:

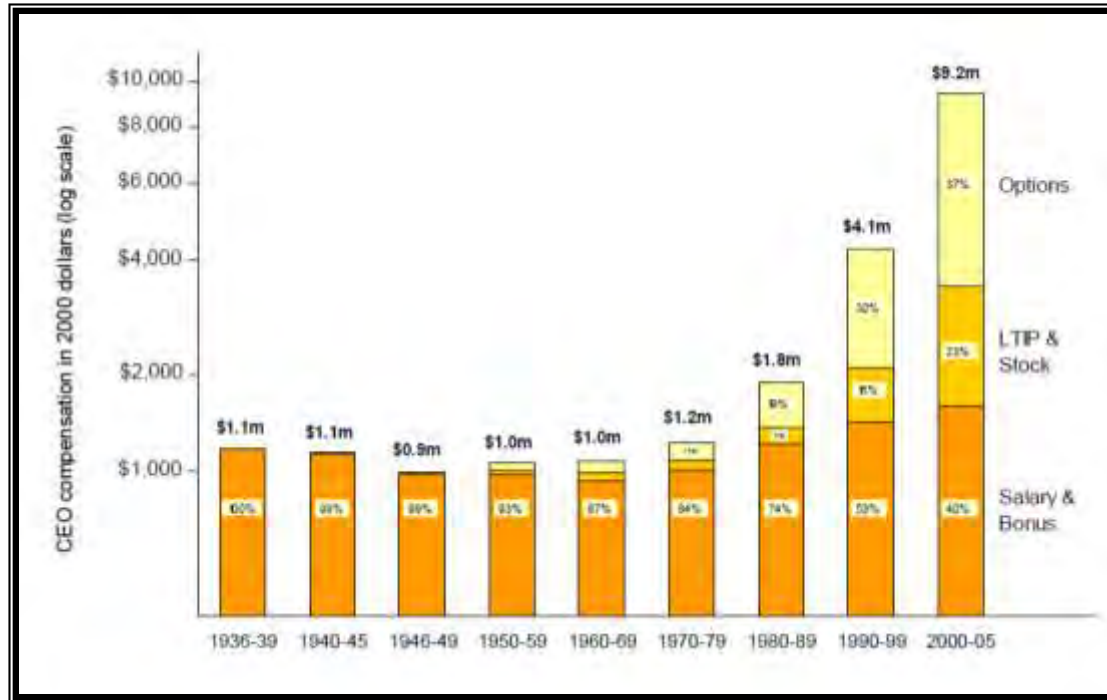
$$AP = K + (1-s) X$$

- ▶ Where:
  - AP= Adjusted Profit
  - K= Base Profit
  - s = Contractor's share ratio
  - X = Final Project Cost
- ▶ **When s = 0; Cost Plus**
- ▶ **When s = 1; Fixed Price**



# Principal-Agent Problem

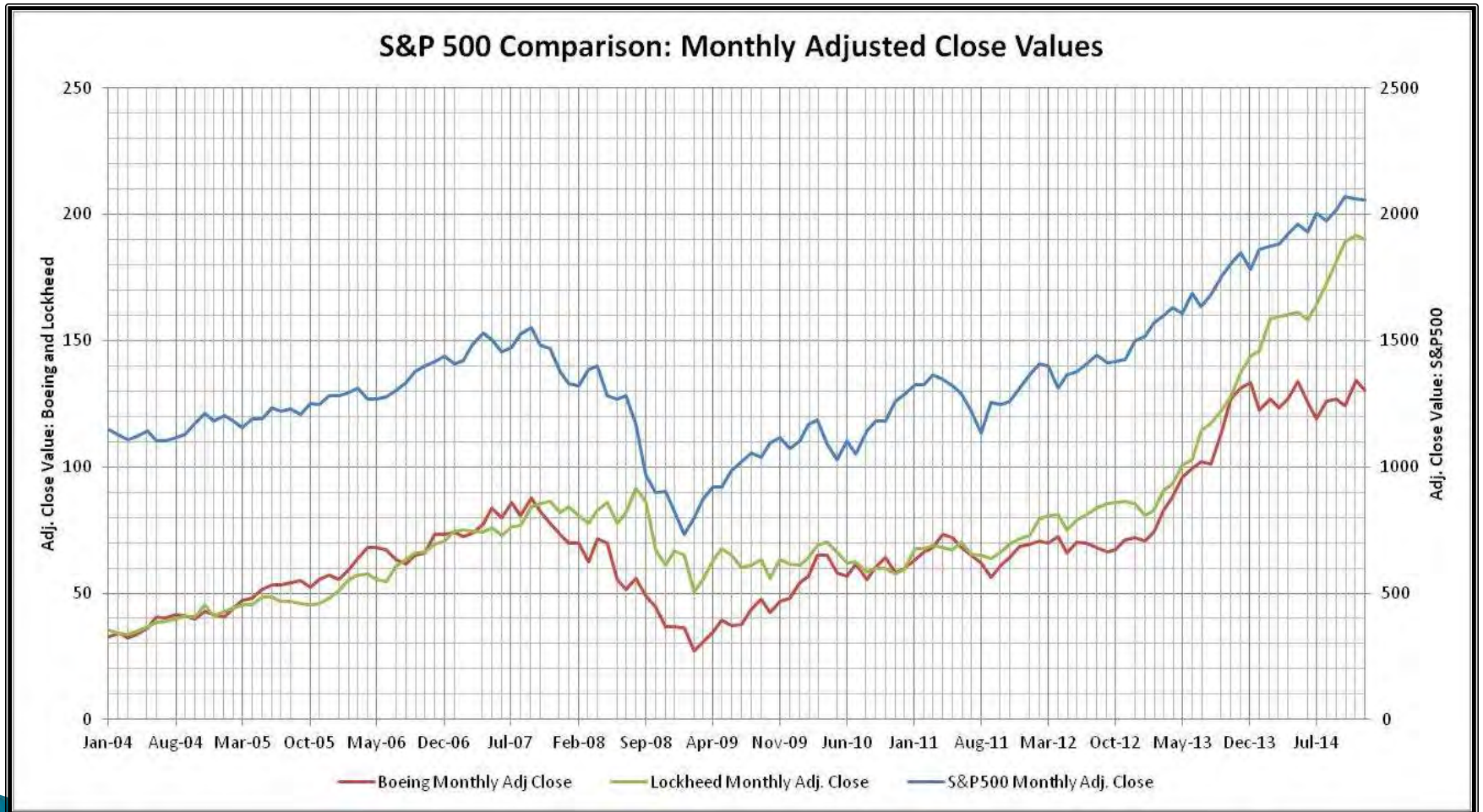
## Present Solution: Stock Compensation



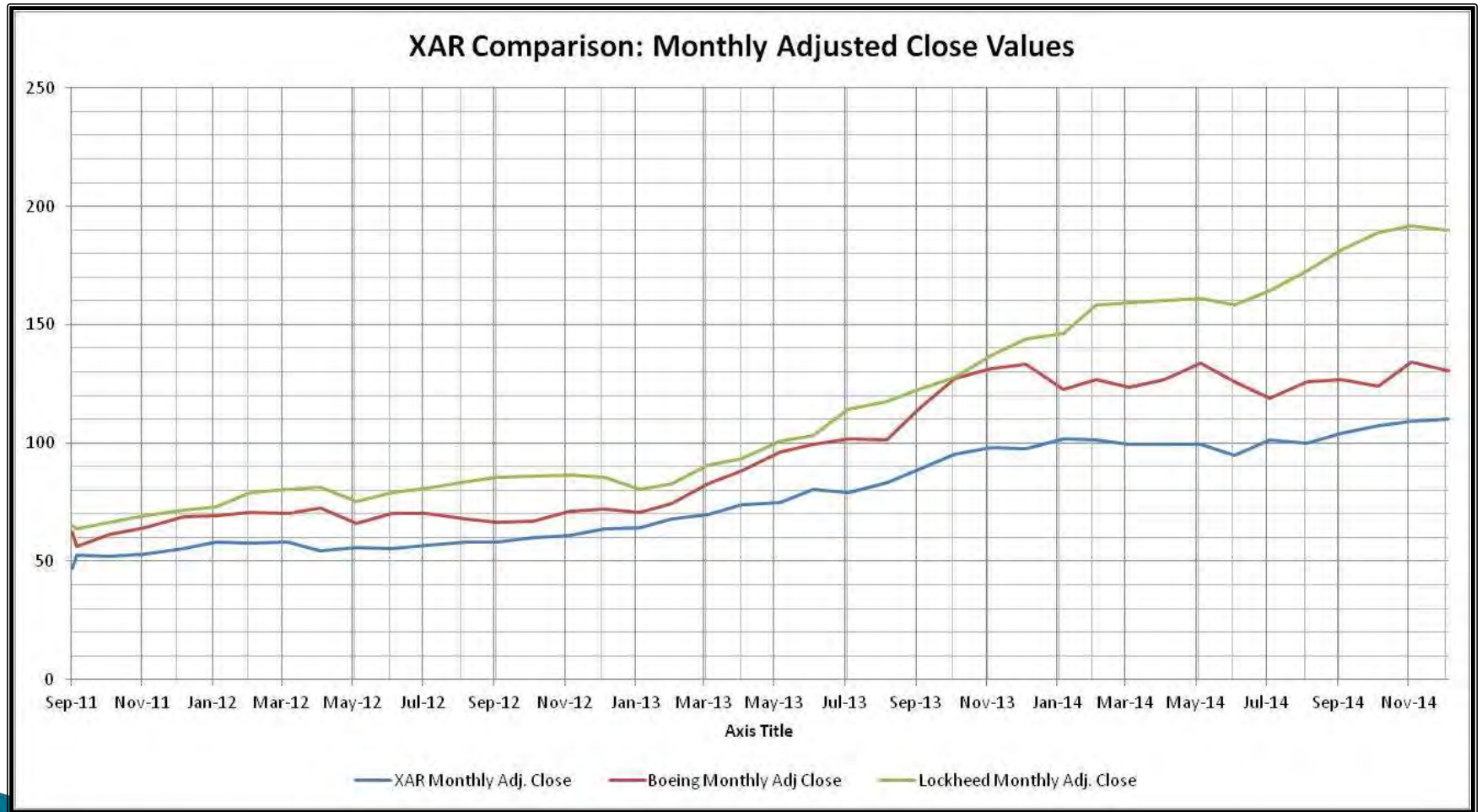
- ▶ The chart shows that CEO pay and compensation have changed dramatically over time
  - Prior to the 1970s
    - Lower levels of pay and moderate levels of stock and stock option compensation
  - Mid-1970s through the end of the 1990s
    - Large increases in compensation and dramatic increase in stock compensation
  - After 1990s
    - Stock compensation is the largest part of executive pay



# Market Analysis: S&P500



# Market Analysis: XAR



# Market Analysis: 10-Year Real Interest Rate

