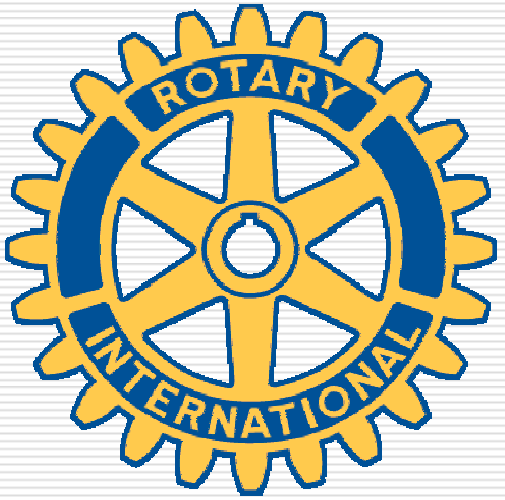
Future of Manufacturing in North America

Myths & Metrics of the New Economy

Rotary Club of Indianapolis

July, 2007

John Layden, CEO
PREVEL Consulting



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Today's Agenda on Manufacturing

- Explode some myths
- Global manufacturing dynamics
- US and Indiana position
- Future success drivers

Indianapolis Star – a long term editorial campaign

- February 6, 2004
- …
- April 3, 2007
- May 6, 2007

- Indiana's employment and economic problems are due to its dependence on traditional manufacturing, especially the "troubled", "turbulent" automotive industry. We have a stubborn grip on our industrial past, dinosaur industries.
- We should be recruiting high-tech, and life sciences companies, convert to the "knowledge economy", create high paying jobs, keep our college grads at home.

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Balderdash!

(Insert expletive of choice here)

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The Star's Position is

- Factually wrong
- Misleading for public policy
- Misdirecting technology and business grads

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Facts about Traditional Manufacturing

- Traditional manufacturing is big, growing, thriving
  - 80% of the US industrial economy
  - Growing at the rate of $100 billion per year
  - Driving the highest productivity in world history
  - Inventing the knowledge economy
- Foundation of the US economy
  - Leverages 2.5 times the secondary jobs as services
  - 61% of US exports – double a decade ago
  - $66k average salary highest of any economic sector (NAM)

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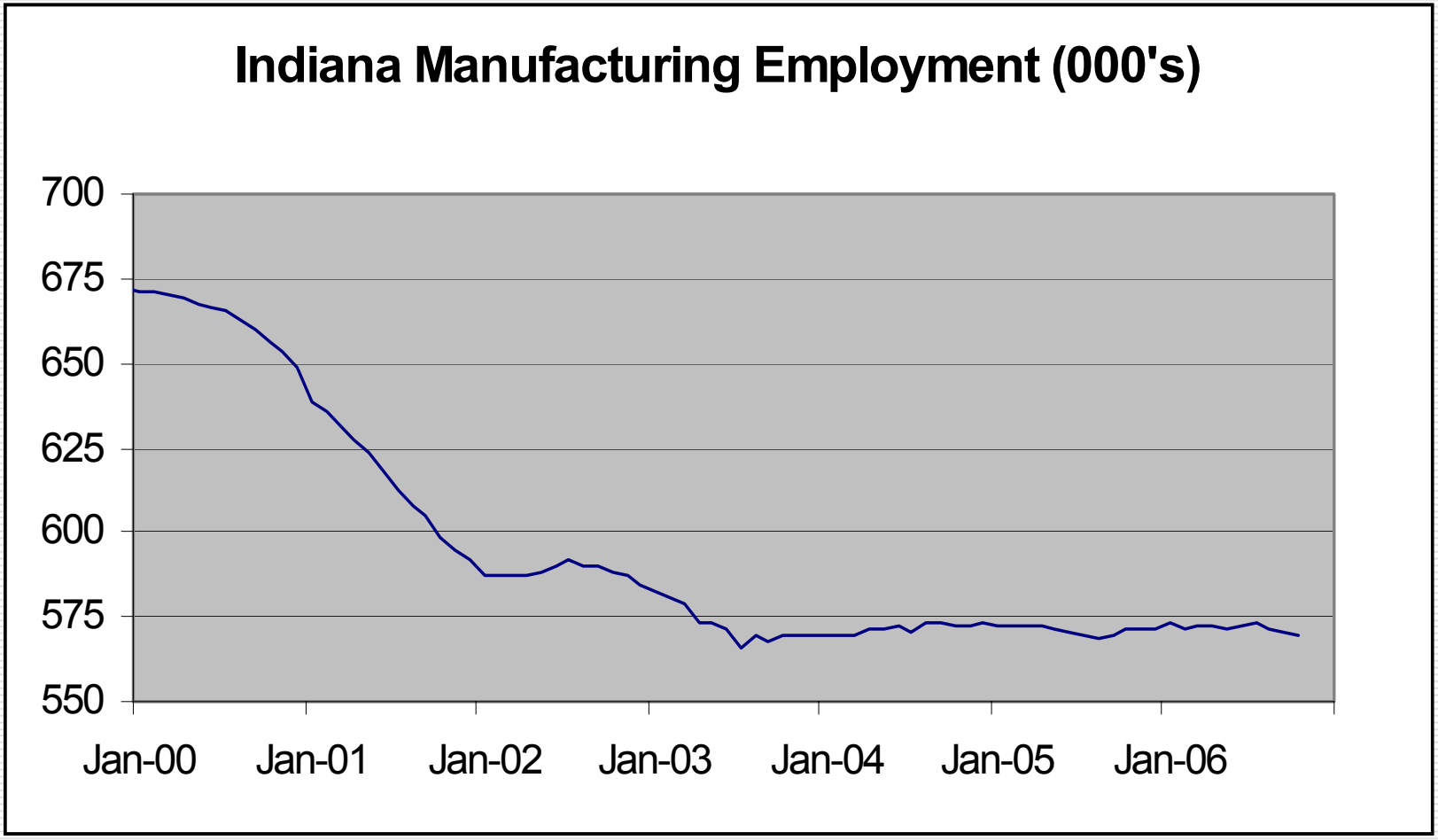
As the Indianapolis Star sees it



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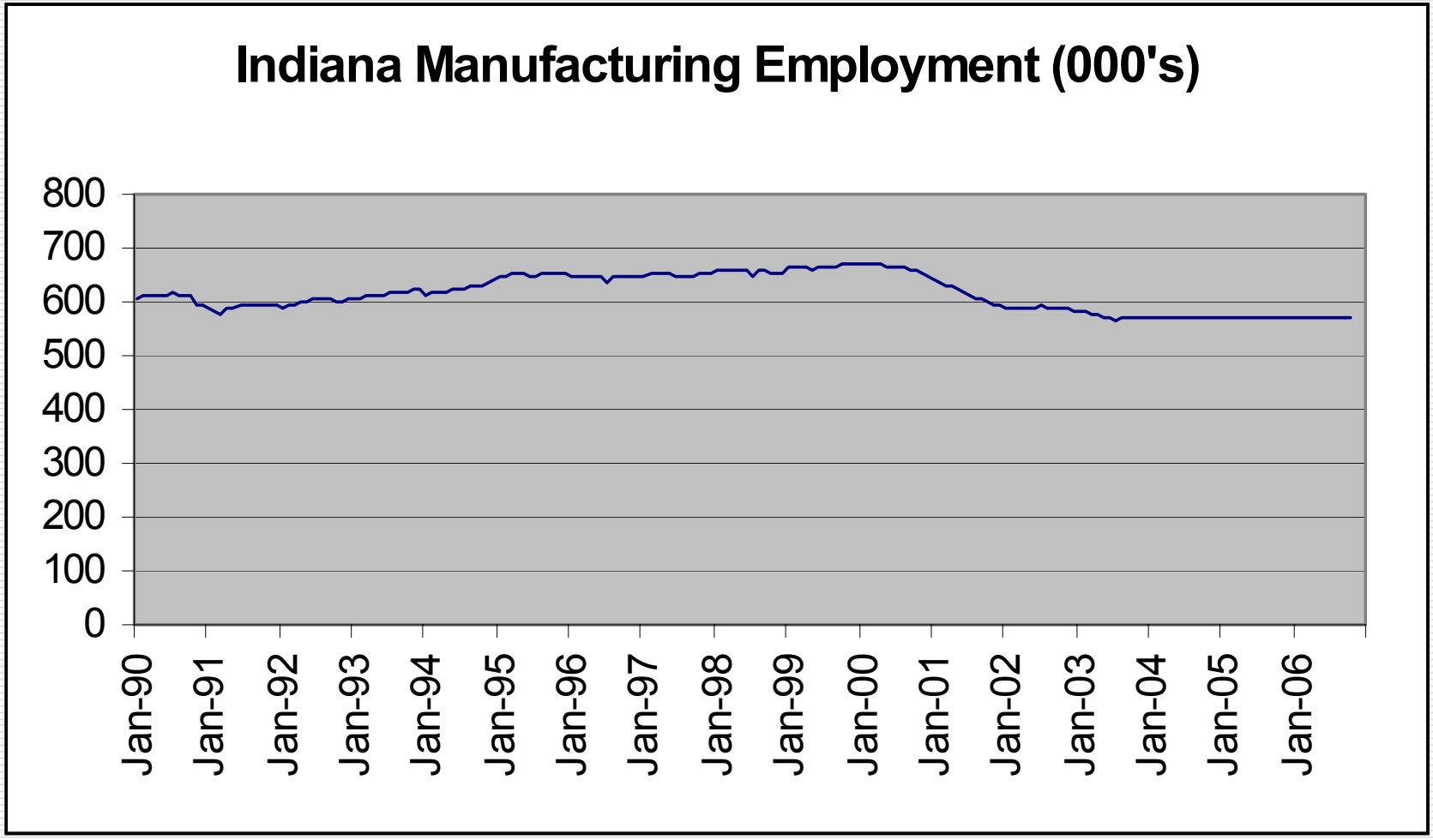
Indiana Manufacturing: A More Measured View



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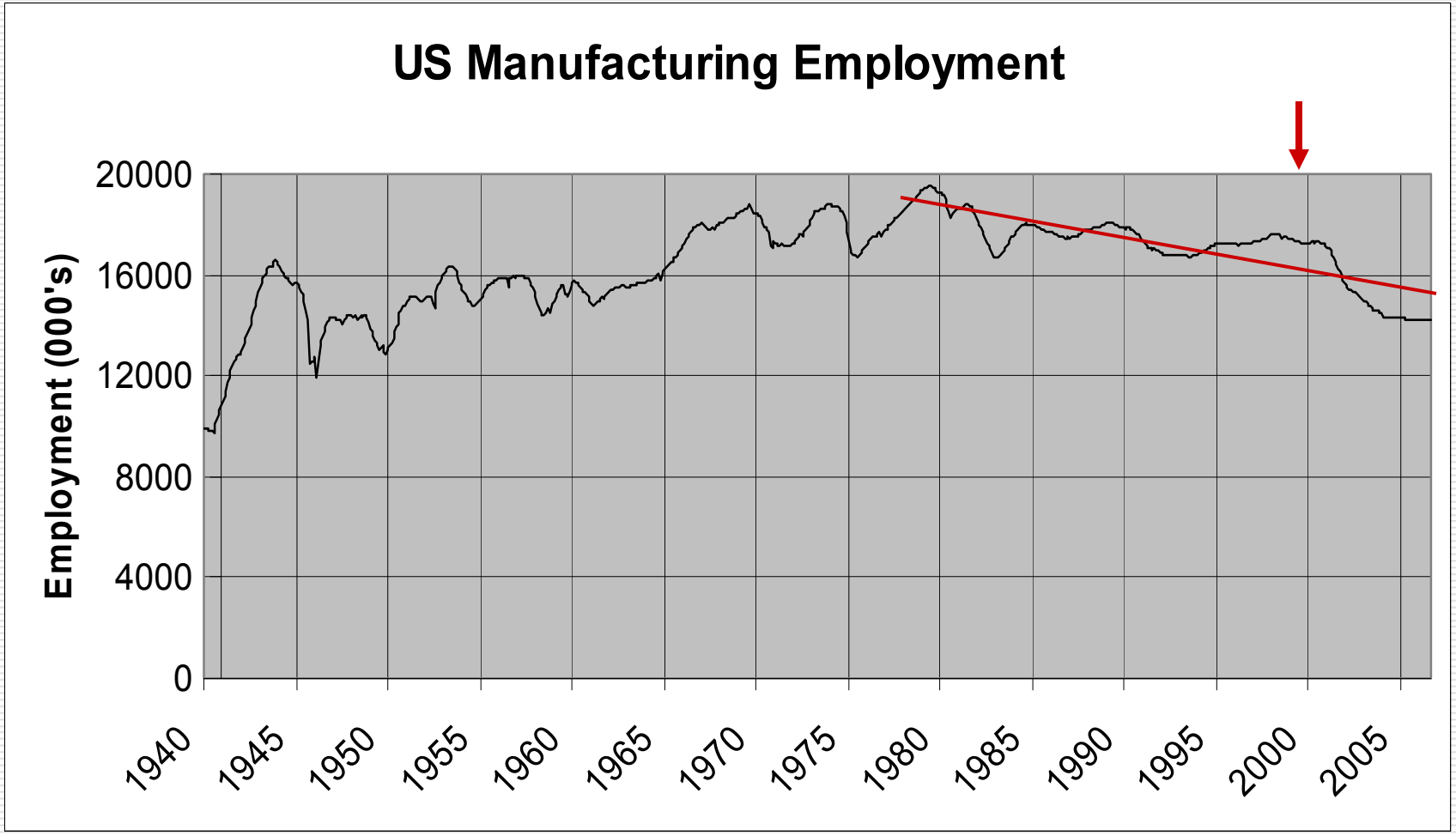
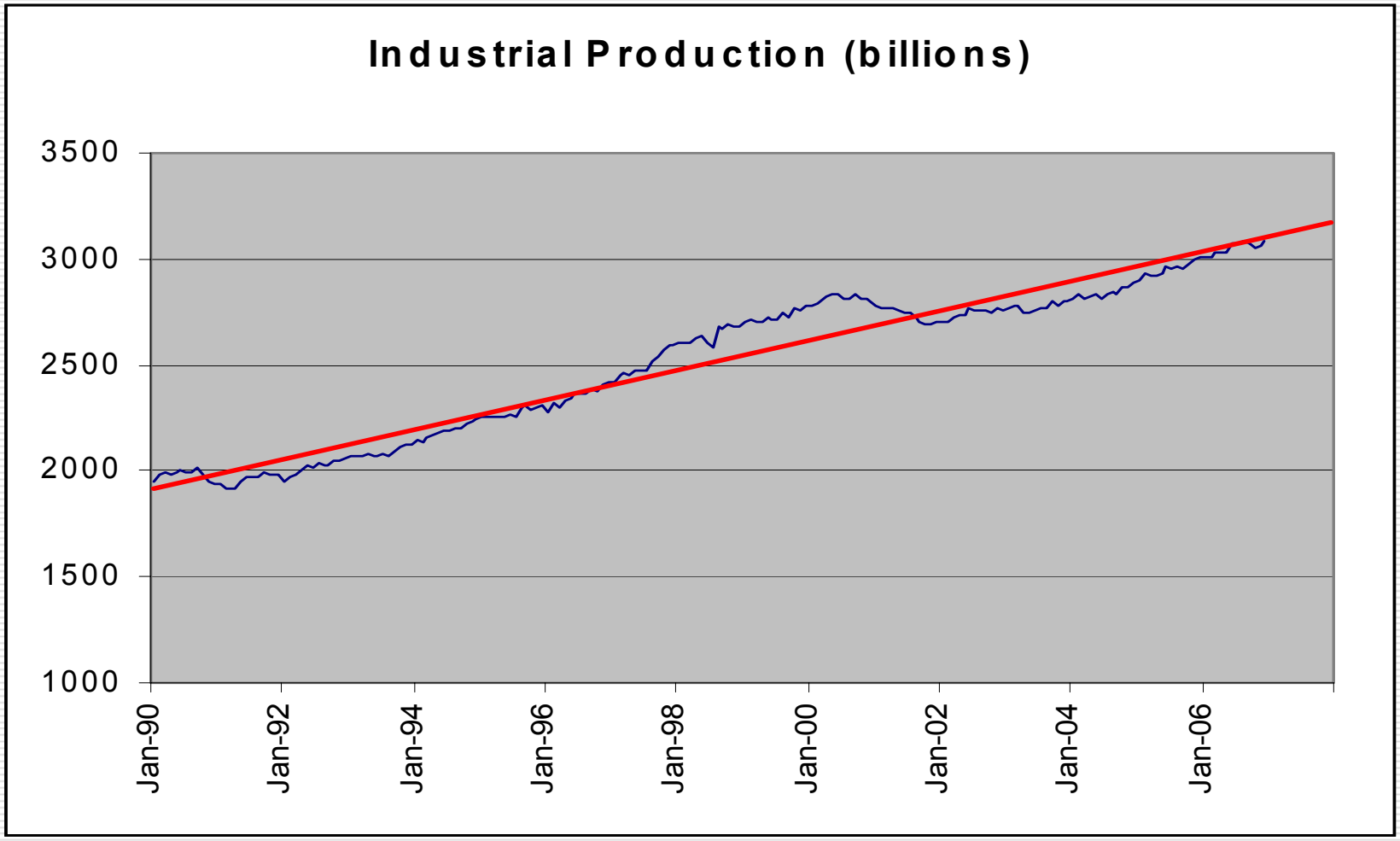
US Manufacturing Employment Trend:
Employment Peaked at 19 million in 1979



US Bureau of Labor Statistics

US Industrial Production: 3 Trillion and Growing



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Top 20 Industrial Economies 1995-2002

- Global growth of industrial economies
  - 30% increase in global industrial output
  - 20% increase in US industrial output
- At the same time…
- 31 million factory jobs disappeared
  - Brazil lost 22% of manufacturing workforce
  - Japan lost 16%
  - Ohio lost 16%
  - China lost 15%
  - Michigan lost 13%
  - US lost 11%
  - Kentucky lost 10%
  - Indiana lost 9%

Joseph Carson, SVP Alliance Capital

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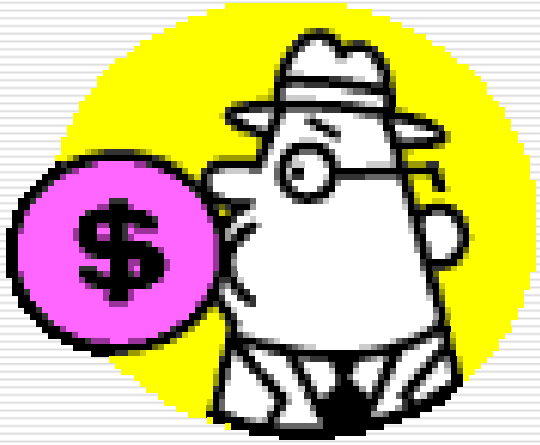
What Really Happened

- Global explosion in manufacturing productivity
  - Led by the application of knowledge technologies in *traditional manufacturing*
- Deflation of the "bubble" economy



Steel Industry in the US

- 1982
- 75 million tons
- 289,000 employees
- 260 tons per employee

- 2002
- 102 million tons
- 74,000 employees
- 1380 tons per employee

Tons/employee increased 5.3 fold in 20 years

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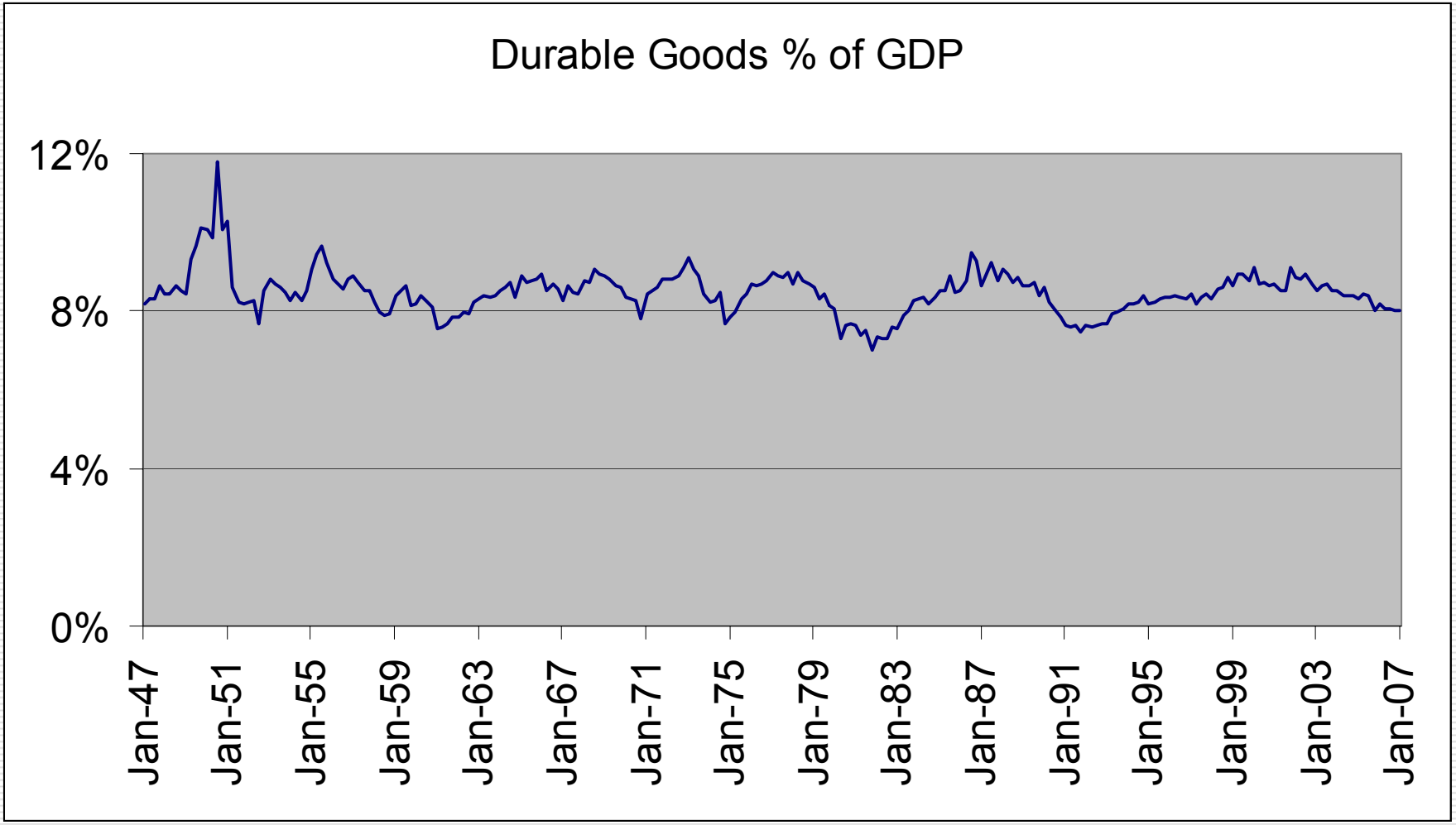
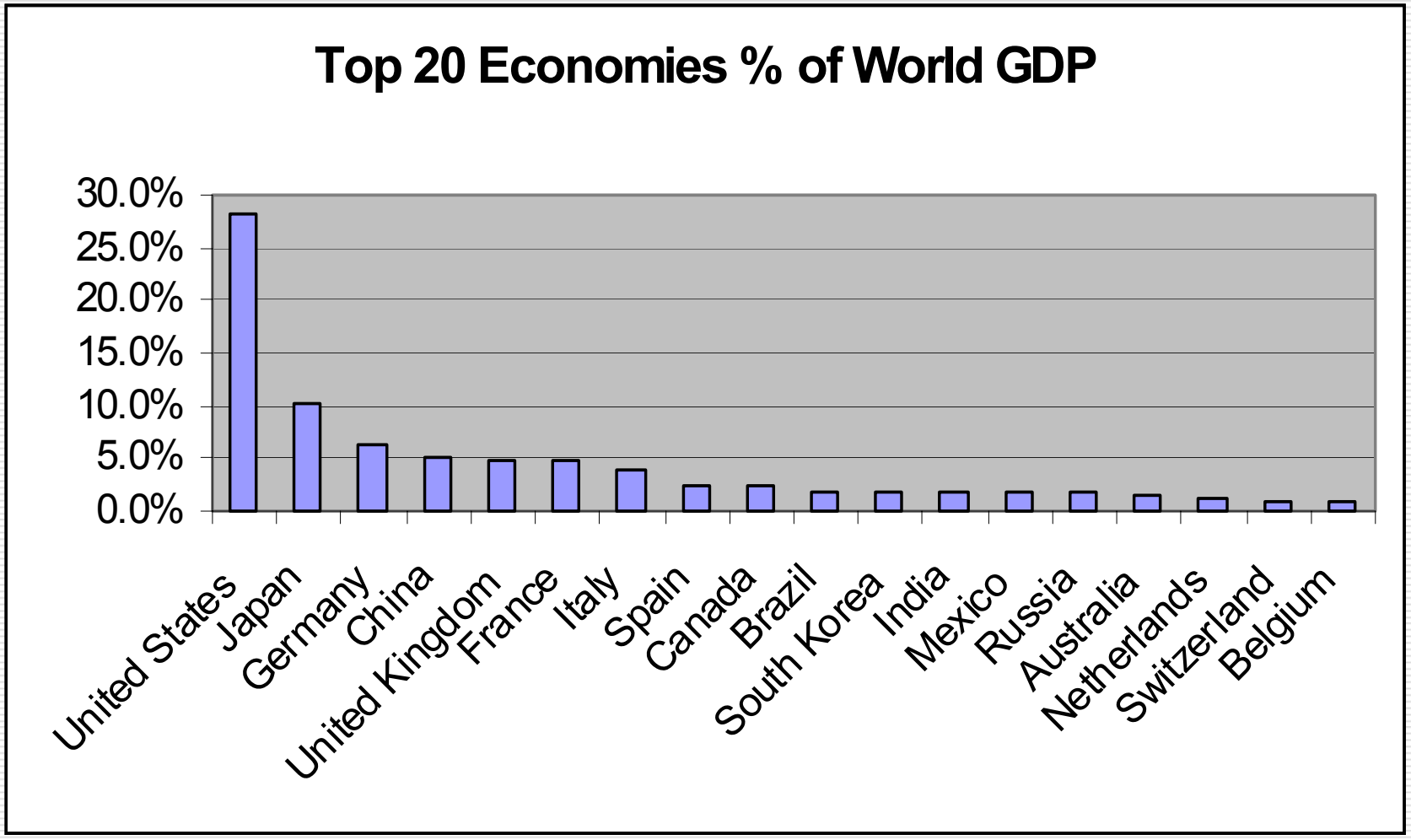
Durable Goods Share of US GDP



US Department of Commerce

2005 World GDP shares



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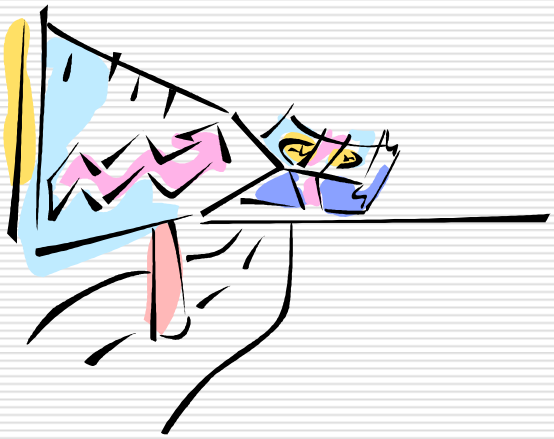
US Economy Ranks:



- First in GDP
- First in GDP growth
- First in profits
- First in productivity improvement
- First in technology and innovation
- First in quality of research institutions

- Because it's the world's strongest *industrial* economy

Newsweek, June 12, 2006, World Economic Forum

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Indiana's Economy Ranks:

- 13th in population
- 8th in manufacturing jobs
- 1st in % of manufacturing jobs

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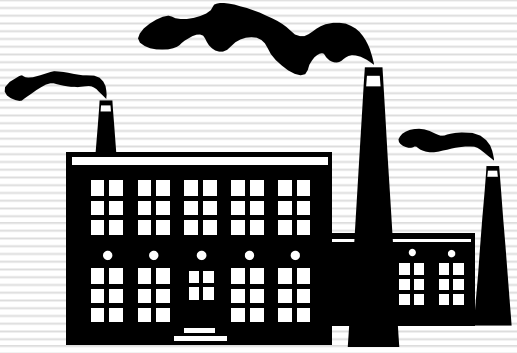
So…If things are so great in manufacturing

- Why are so many plants closing?
  - Visteon, Thomson, Chrysler foundry…
  - 41 US Pharmaceutical and Biotech plants in 2007

In Spite of the Thriving Manufacturing Sector

- Not all companies are thriving
  - Ford and Chrysler are troubled…
  - …Honda and Toyota are not

- In thriving companies, not all plants survive…
  - Product obsolescence – especially high tech
  - Market geography shifts
  - Productivity upgrades
  - Status quo management



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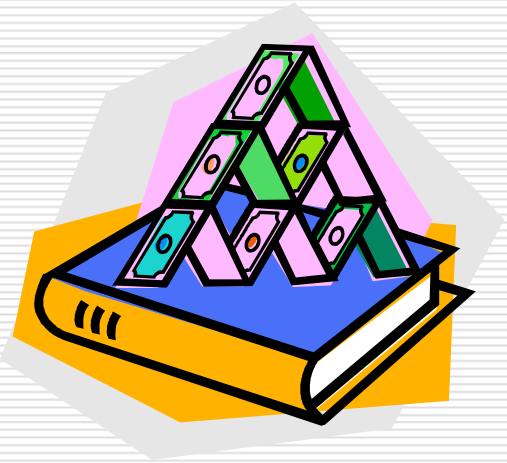
The Challenge for Manufacturing

Retooling Obsolete Myths



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Myths in Manufacturing

- Volume grows profit
- Margin matters
- Inventory management
- Offshore sourcing

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Myths: Offshoring

If it's so great, why do Honda and Toyota require their suppliers to locate within 100 miles of their US plants?

BTW: Why are they building plants here in the first place?

Just asking…

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Myth: Volume Grows Profit

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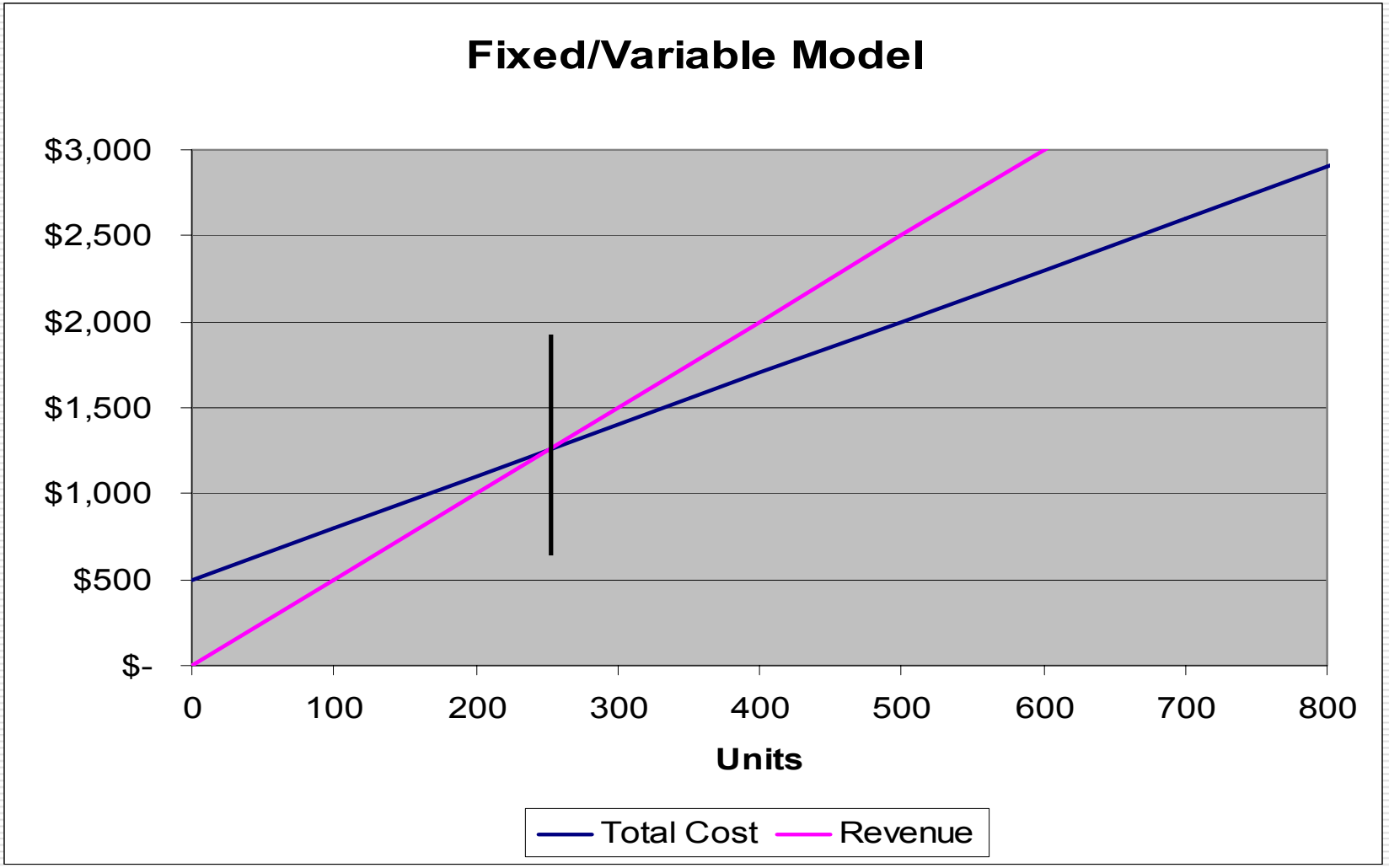
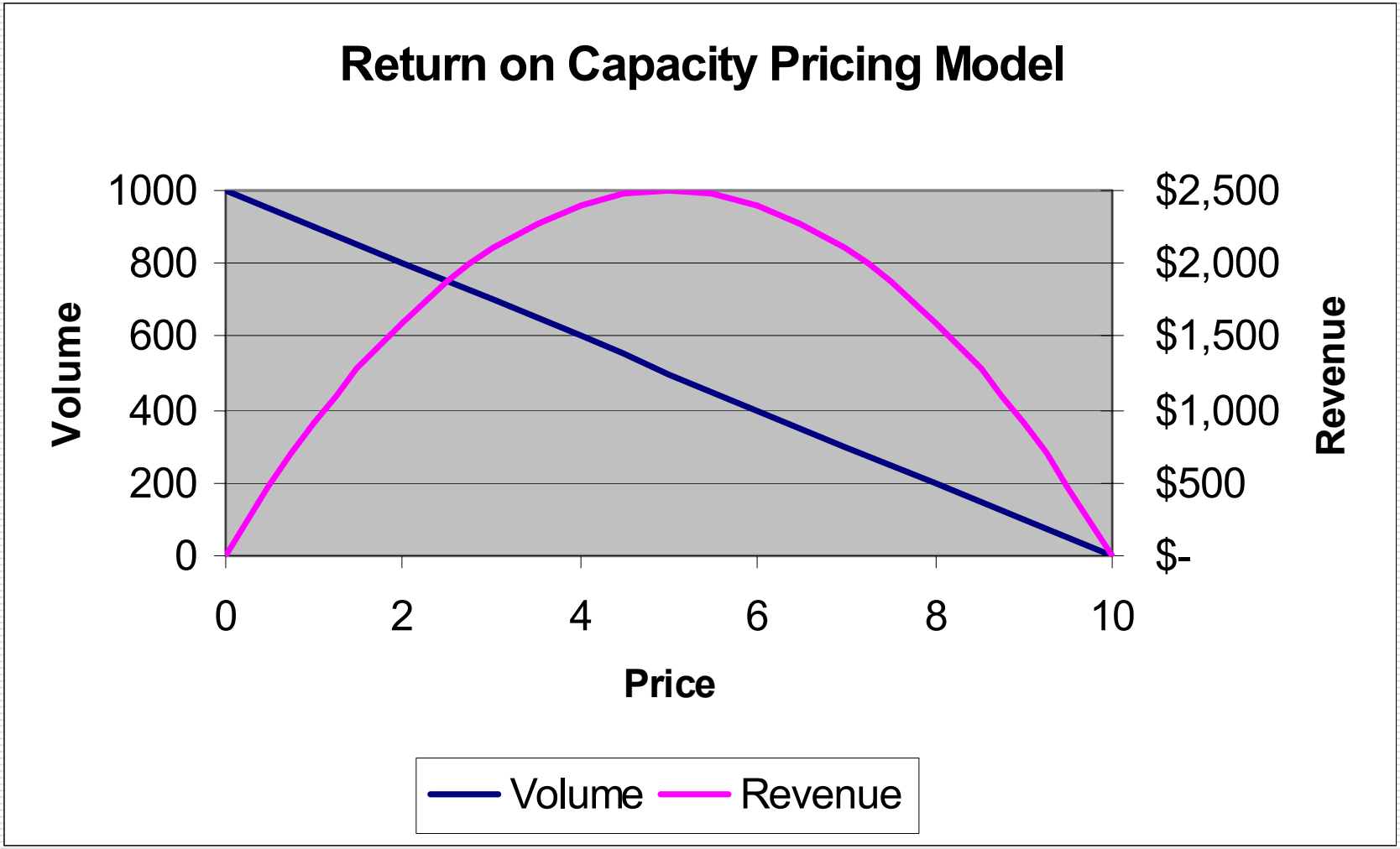
Volume/Profit: The Traditional View

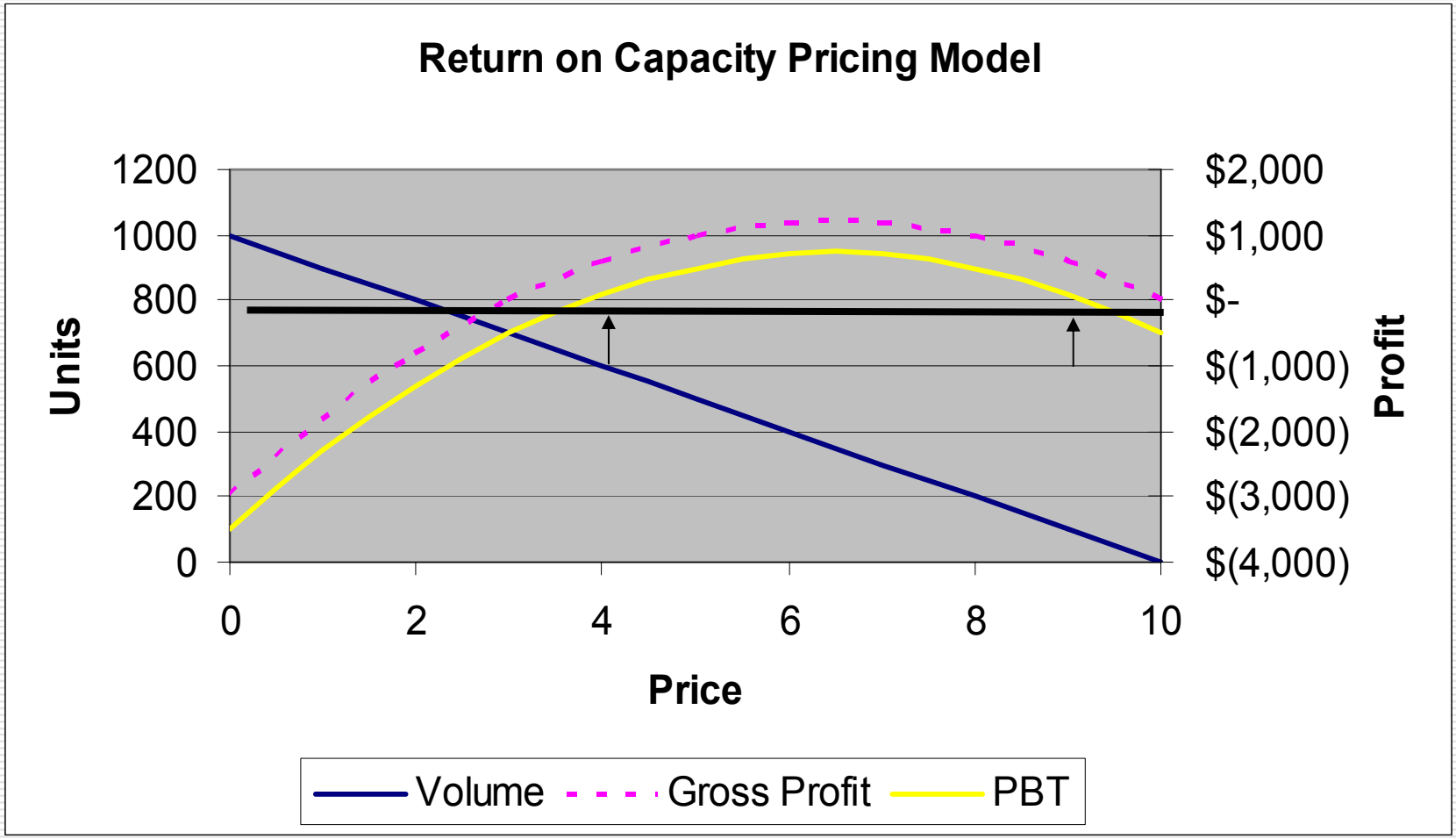


Pricing: A Profit Focused Model

Raising prices will decrease volume, but increase revenue



Pricing: Profit Maximum



Transitions

- Manage for profit, not volume
- …then for cash, then for growth
- Profit drives growth, not the reverse

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Myth: Margin Matters

If high-margin products are so great, why is all the big money made in commodities?

Just asking…

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Using Product Focus to Improve Profitability

Base Case	Product A	Product B	Total
Revenue	$ 93.50	$ 90.00	$ 183.50
Gross Profit	$ 37.40	$ 18.00	$ 55.40
Gross Margin	40%	20%	30%
SGA			$ 40.00
Pre Tax Profit			$ 15.40
Pre Tax Margin			8%
Capacity Units	85	15	100
GP Return on Capacity	$ 0.44	$ 1.20	$ 0.55

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High Margin Focus

Increase Product A	Product A	Product B	Total
Revenue	$ 104.50	$ 30.00	$ 134.50
Gross Profit	$ 41.80	$ 6.00	$ 47.80
Gross Margin	40%	20%	36%
SGA			$ 40.00
Pre Tax Profit			$ 7.80
Pre Tax Margin			6%
Capacity Units	95	5	100
GP Return on Capacity	$ 0.44	$ 1.20	$ 0.48

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Return on Capacity Focus

Increase Product B	Product A	Product B	Total
Revenue	$ 5.50	$ 570.00	$ 575.50
Gross Profit	$ 2.20	$ 114.00	$ 116.20
Gross Margin	40%	20%	20%
SGA			$ 40.00
Pre Tax Profit			$ 76.20
Pre Tax Margin			13%
Capacity Units	5	95	100
GP Return on Capacity	$ 0.44	$ 1.20	$ 1.16

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Transitions

- Quit worrying about margin and go make some money.

- You can't run a business from the P&L.
- "Capacity based" accounting replaces cost accounting for business analytics & decision support (but not for historical reporting)

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Myth: Inventory Control

The forecast is always wrong…

…Get over it

Inventory happens

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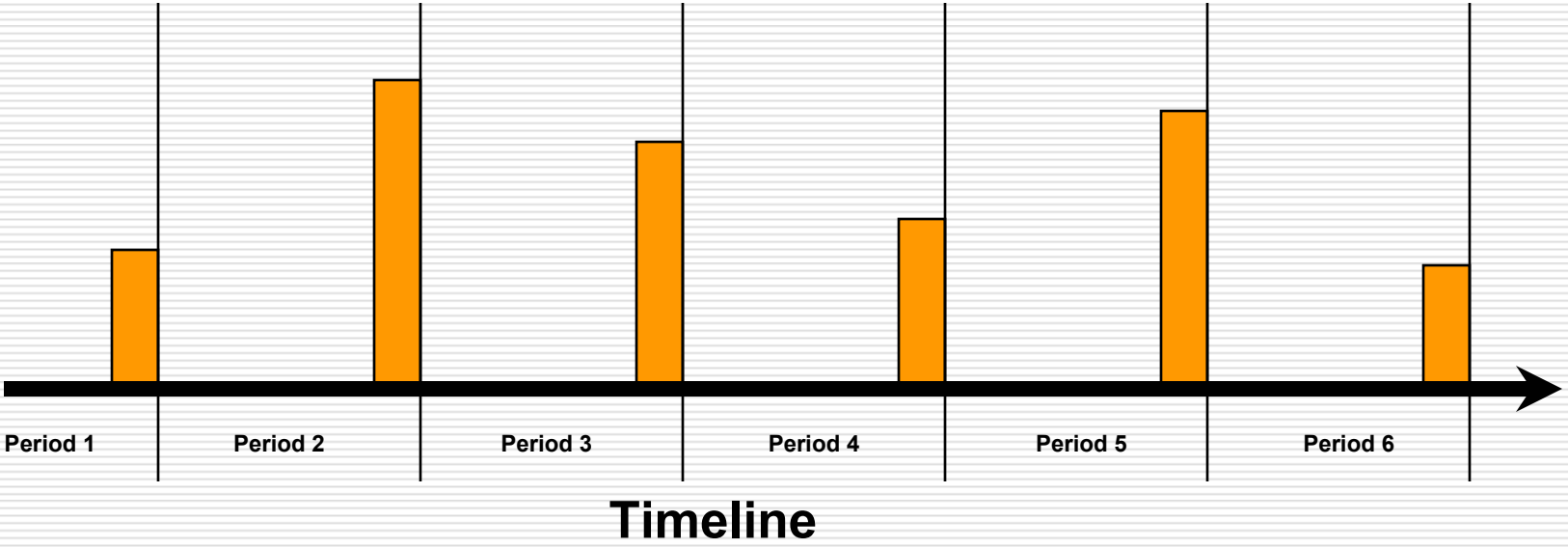
First Generation Planning Models:

Traditional "Period Planning Process" focused on quantity

Similar to Analog Signals



Fixed period, variable quantity

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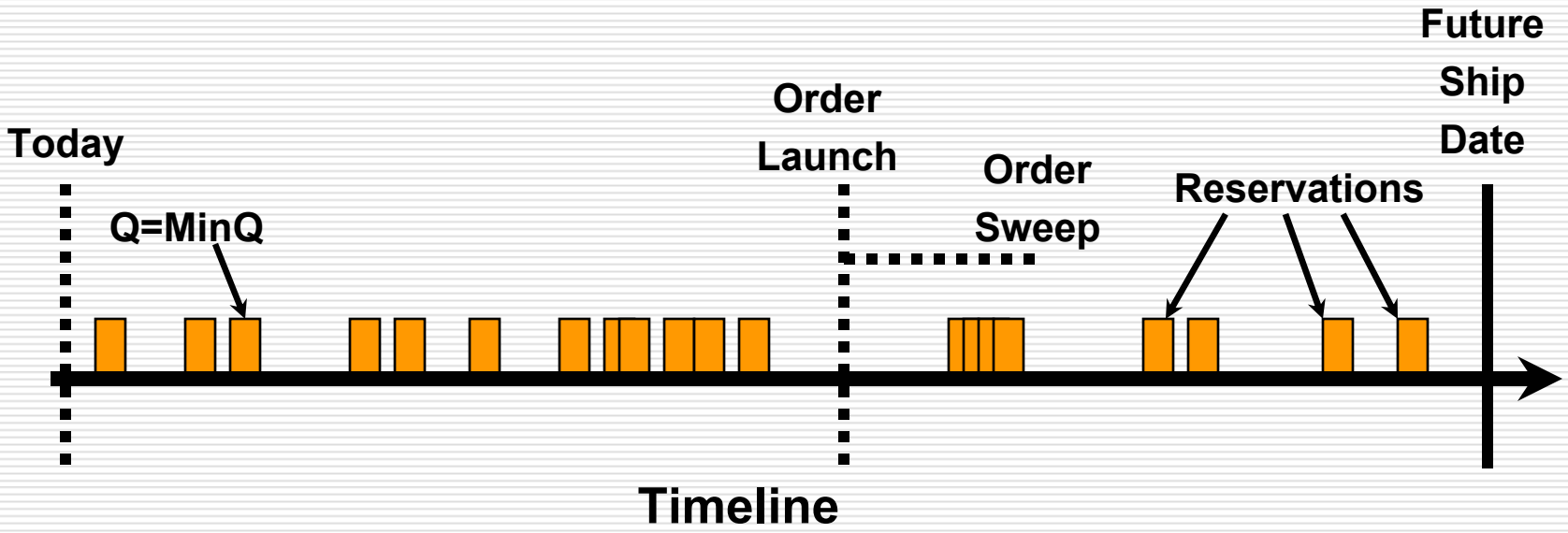
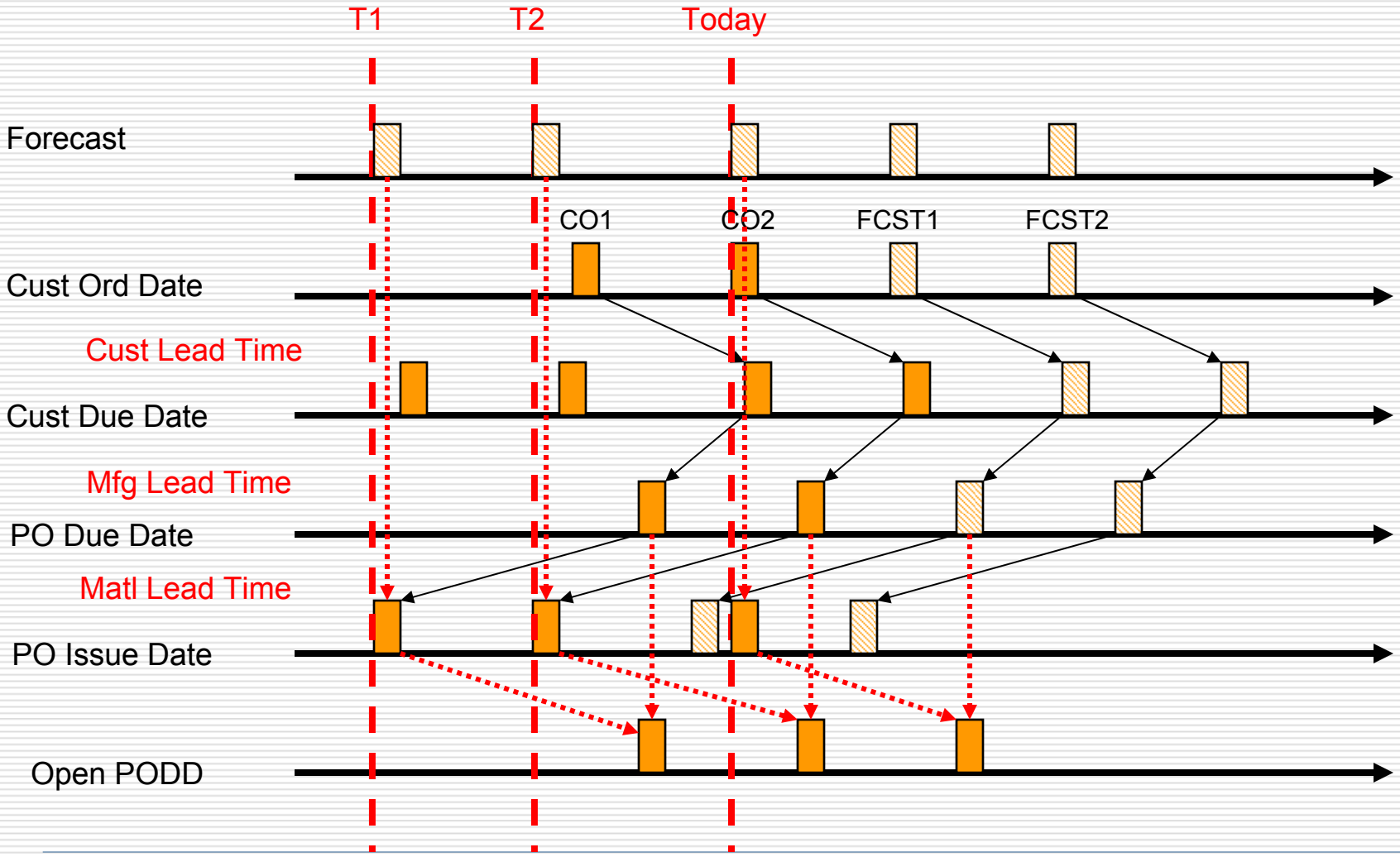
Second Generation Planning Model:
Digital Supply Chain focused on time

Similar to Digital Signals (PCM)



Variable period, fixed quantity

Third Generation Planning Model:
Concurrent, multi-site pipeline synchronization



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Transition

- Multi-site synchronous flow
- Real-time integration S&OP + Factory Planning

Summary: The New Rules

- Rapid change as a way of life
  - Learning is not compulsory…neither is survival
- New ways to drive productivity, profit
  - Velocity + agility replaces efficiency
- Operational Excellence as strategy
  - Get on offense on price and mix
  - "Return on Capacity" replaces "Return on Sales"
  - Synchronous flow replaces "Lean" and "Pull"
  - Six Sigma returns to its roots
- Entrepreneurial leadership everywhere

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Public Policy Goals

- Economic Development:
  - Aggressive recruiting in all sectors
  - Global communications strategy
  - Build competitive infrastructure
  - Competitive tax policy
- Education:
  - Support for major research universities
  - Traditional manufacturing skills
  - Mandatory economics in high school
- Global Advanced Manufacturing Institute

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Layden's Laws

- The forecast is always wrong - get over it
- Firm fixed schedule is the most dynamic
- Inventory happens
- You can't get to zero defects by counting defects
- You can't improve productivity by making parts nobody wants
- The longer you delay a correction, the more violent the correction needs to be

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John E. Layden
Biographical Sketch

Mr. Layden is the CEO of Prevel Consulting, a consultancy serving manufacturing, distribution, and their supporting infrastructure. Prevel improves financial performance through high velocity/high response operating strategies, and supporting business analytics.

Prior to launching Prevel, Layden's career included over 20 years' in manufacturing and another 18 years in enterprise software. Most recently he has served as VP of Supply Chain Management for SAP and VP of Supply Chain Market Development for Frontstep, Inc. He served as President of Pritsker Corporation, an early innovator in the Advanced Planning and Scheduling field, and negotiated the Pritsker acquisition by Frontstep in 1997. He was a founder and CEO of Automated Technology Associates, Inc.

Layden has authored over 40 articles and papers on both the theory and practice of manufacturing and supply chain operations. He has been described by one editor as one of the "founding fathers" of the Advanced Planning and Scheduling (APS) industry. He also authored the supply chain chapter in Maynard's Industrial Engineers Handbook. He speaks worldwide on the subject of world class operating strategies. He has been the keynote speaker at the Automation Hall of Fame Awards and numerous conferences.

As a software company CEO, Layden delivered to market the first real-time advanced planning and scheduling system; the first real-time SPC system; and the first real-time, fourth-normal-form database system. He is the originator of the Return on Capacity modeling process for analysis and improvement of supply chain profitability and delivery performance.

As a key partner to Motorola, Layden developed the quality control concepts that became the Six Sigma Initiative. He introduced the same concepts to GE and the Cadillac Division of General Motors. These initiatives contributed to the Malcom Baldrige awards won by Motorola and Cadillac, and to the highly publicized Six Sigma program at GE. He introduced the Six Sigma concepts to software development and delivered the only application software release to meet these exacting quality standards. Layden holds three patents and is the only American to hold a Japanese patent in quality control.

Prior to his tenure in manufacturing software, Layden spent 20 years as an engineer, operating executive and board member with three Fortune 200 manufacturing companies. The advisory services of Prevel retain the practical, no-nonsense approach familiar to world class operating executives. His operating roles included plant manager, director of business planning, and VP of Supply Chain Management in the delivery of appliances to Sears.

Layden currently serves on 4 boards of directors, and advises several high technology startup companies.

Mr. Layden holds a BS degree from Purdue University in Electrical Engineering and an MBA from the University of Wisconsin-Milwaukee (Executive Program). He is active with the Purdue University Laboratory for the Extended Enterprise, the Purdue University President's Council, and the Villanova University Supply Chain Forum. He is a guest lecturer at Columbia University graduate school, Ball State University, Villanova University and others. He can be reached at jlayden@prevelconsult.com or 317-842-6417.