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The Auto Future: Fast, Fun and Scary

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Center for Automotive Research (CAR)

Geography of Auto Production—
Will Detroit Continue to be Industry's Hub?
Federal Reserve Bank of Chicago
Detroit Branch
November 3, 2003

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Auto Industry—Like Pro Football

Everyone is Fast and Hits Hard

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Industry, Highly Unstable —

Not in Final Form

Competition

Relentless

Unforgiving

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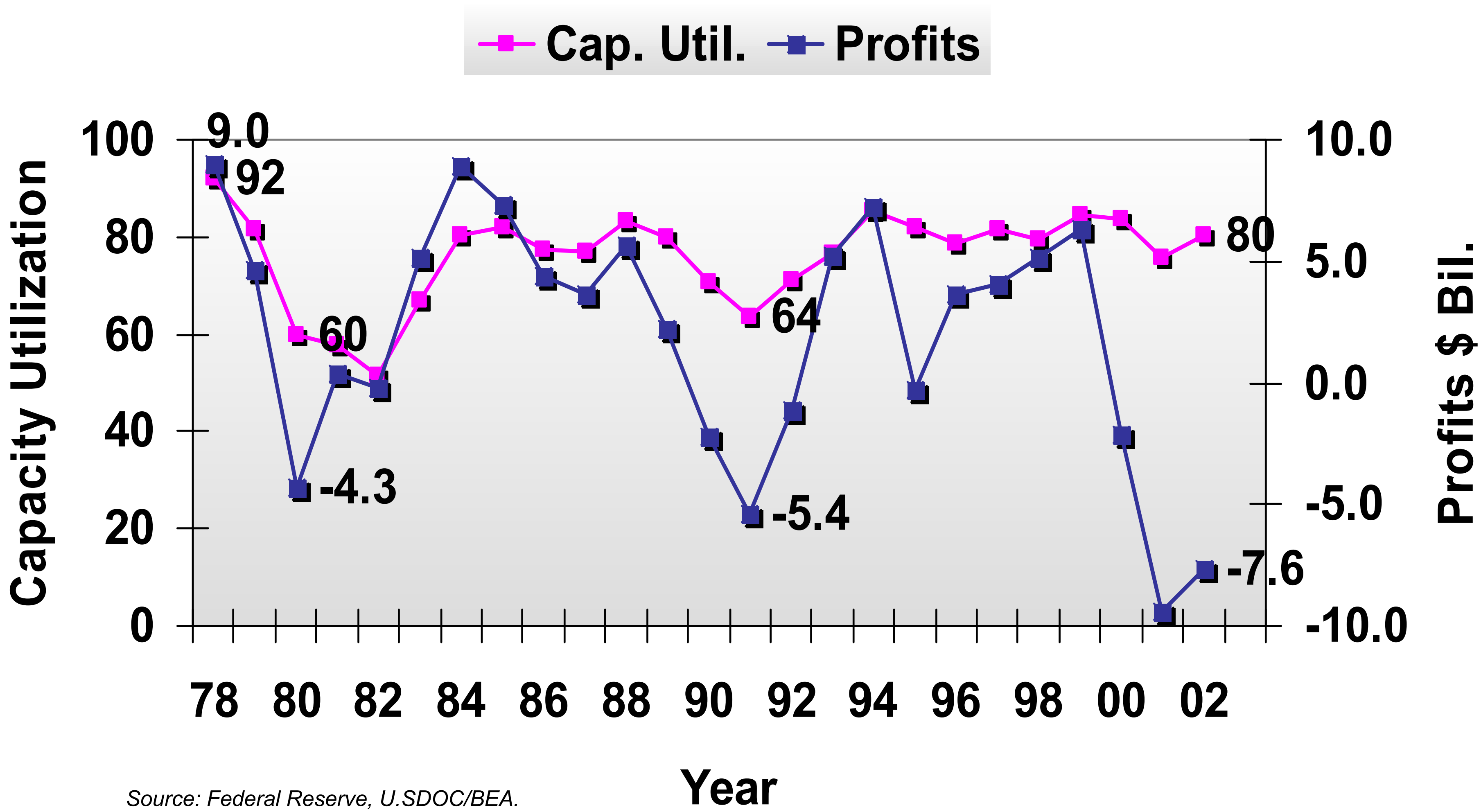
Is the Business Model Broken?
U.S. Automotive Capacity Utilization and Profits
1978 - 2002



Source: Federal Reserve, U.SDOC/BEA.

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The Old Business Model is Broken

Vertical Integration

Talk

Paper

Bureaucracy

Linear

Slow

Old Business Model

Lean

Physical Prototypes

Control

Legalistic

Sequential

Individual

Job for Life

Kings

Regional

Competition

Acquisitions

Structured

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Listen

Virtual Integration

Real-Time Collaboration

Paperless

Anti-bureaucracy

New Business Model

Fast

Lean

Agile

Empowerment

Trust

Virtual Prototypes

Team

e-enabled

Parallel

People Flow

Coaches

Global

Coopetition

Alliances

Flexible

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Lean / Agile

- Investment
- Engineering
- Manufacturing
- Everything

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Old Economy

New Economy

Value Economy

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Cost of Risk is Decreasing

Auto Industry 2006

- Successful manufacturers and suppliers
- Strong market
- Great products
- But—not everyone made it

Capacity, People, Companies —

25% Reduction

But Still Important

- Production
- Knowledge Center

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Economic Contribution of the U.S. Automotive Industry

- Manufacturing
- Retail

Auto Manufacturing

Manufacturers . . . . . 620,000 + jobs

Suppliers . . . . 1,800,000 + jobs

R & D Spending . . . $18+ billion

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Economic Contribution Per Job

Auto Mfr.	$292,000
Average Job	$ 73,000
Average Mfg.	$120,000

Economic Multiplier

Auto Manufacturers – 7.6

New Vehicle Dealers – 2.7

Foundation for Excellence

- Smarter Industry
- Platform / Component Set Rationalization
- Faster, Better Product Development
- Manufacturing Flexibility
- Stronger Processes
- Discipline
- Supplier Competence
- Lean Everything

Future Profits

- Price Increase
- Market Share
- Cost Reduction

Cost Reduction — Survival Issue

- Low Investment
- Modular Design / Construction
- Global Sourcing
- Flexible, Lean Manufacturing
- Fast Product Development
- High Volume Platforms and Component Sets

Knowledge

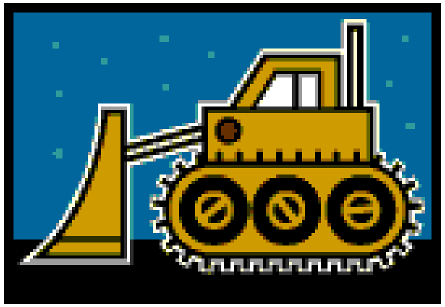
The Competitive Edge

Customer Pull

Cars and Trucks

Technology Push

Product and Process



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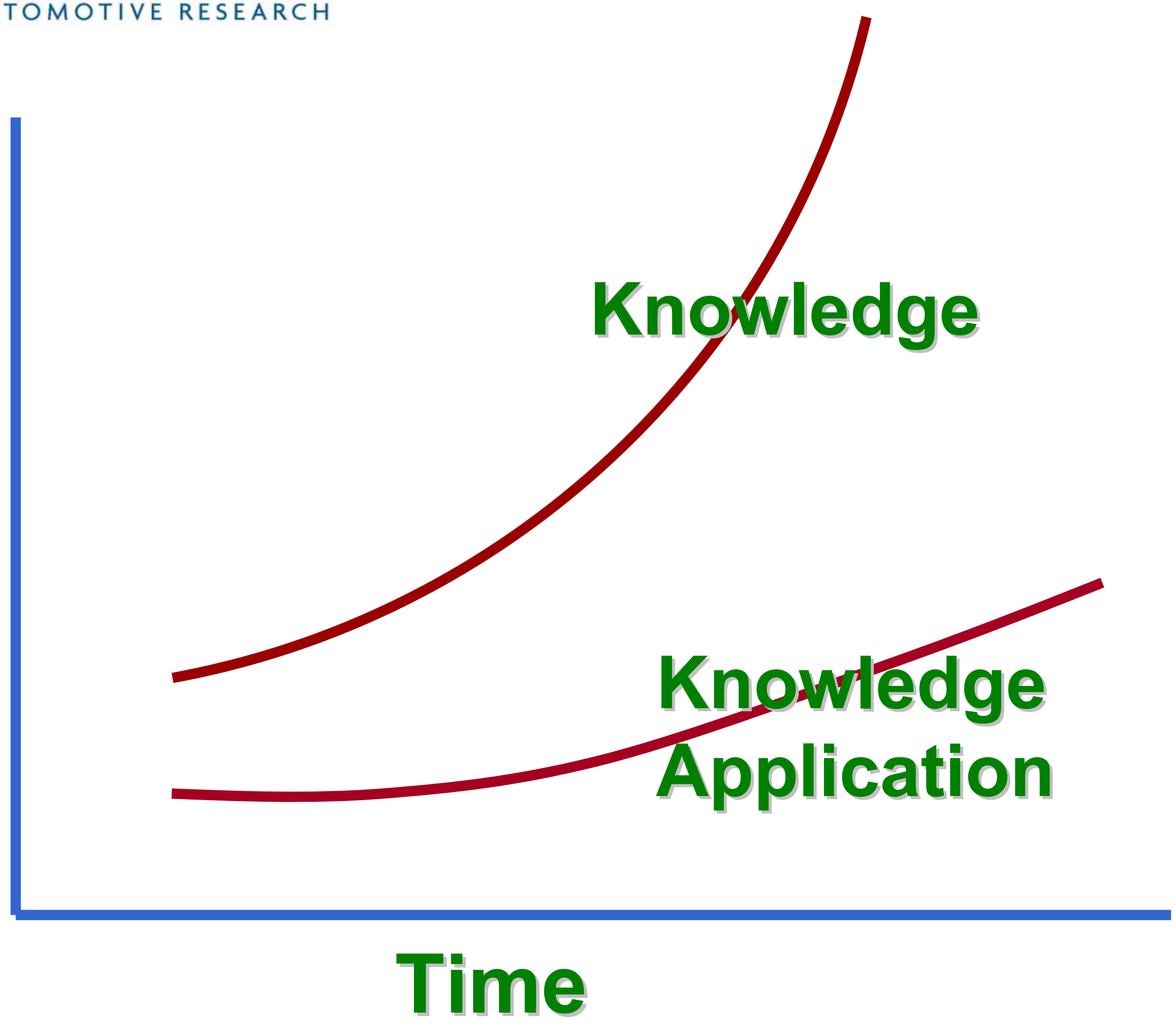

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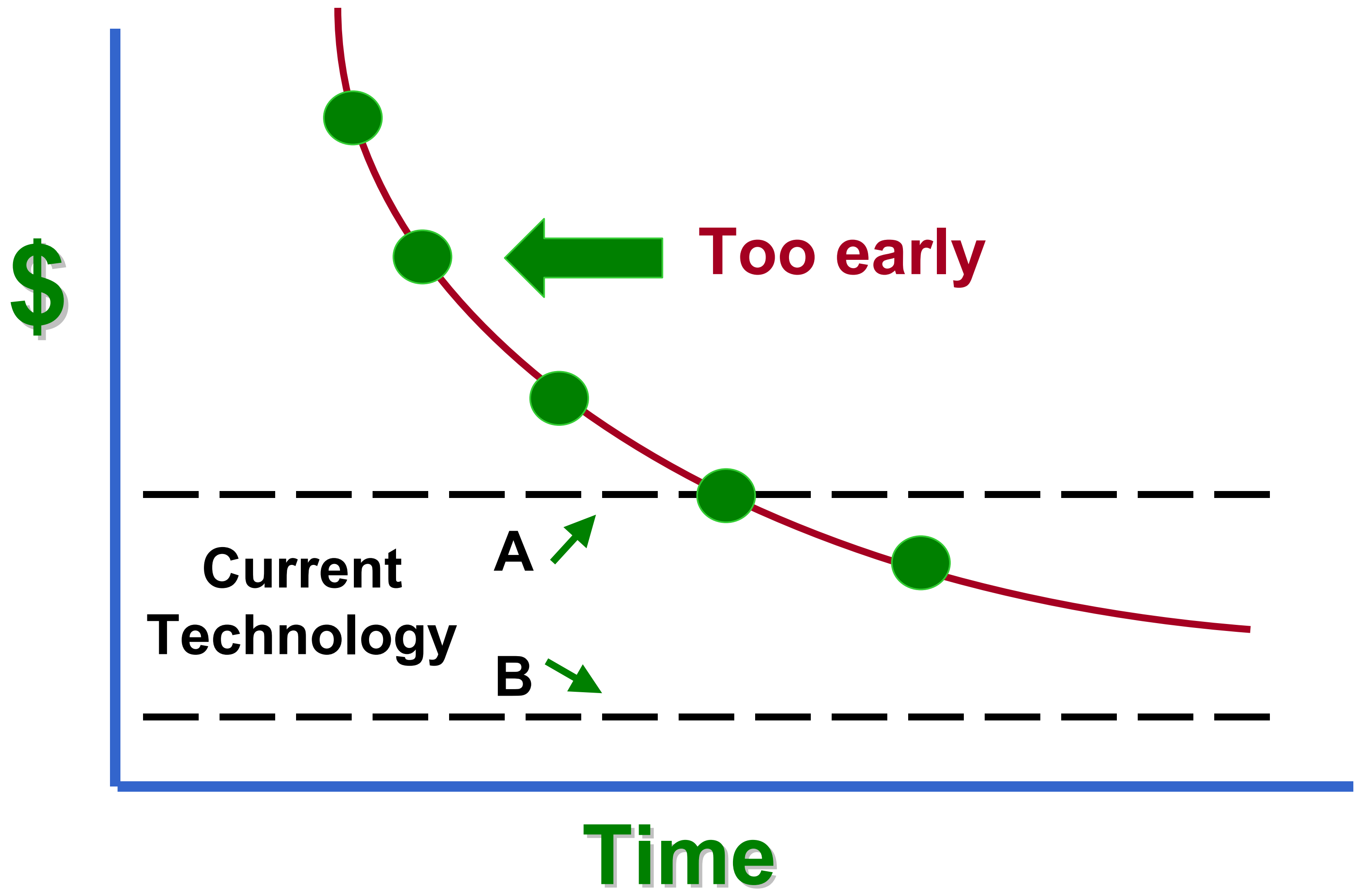
Product Technology

At the edge of a revolution?

Technological Progress—When to Commercialize



Future Power Technology

- Advanced Gasoline
- Clean Diesel
- Hybrids
- Fuel Cell

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Engine Redesign — 2009

Four Cylinder	52.5%
V-6	50
V-8	40

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Electrical / Electronic Content

	Current	2009
Total Combined E/E	20	31.5
Electronic Content	10	20

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Future Trends

It’s Economics Stupid

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Auto Future

- A Few Big Dogs
- Consolidation Continues
- Modular Explosion
- Super Suppliers – Tier 1 & 2
- Lean — Agile
- Fast, Smart, Rich, Global
- Technology Revolution
- Survival of the Fittest