Electronics and assembler-supplier relations

The growing role of electronics in automobiles
Automotive Outlook Symposium Workshop 2011
Detroit, MI
June 2, 2011

Thomas Klier
Senior Economist
Federal Reserve Bank of Chicago
thomas.klier@chi.frb.org
www.chicagofed.org

Jim Rubenstein
Professor
Miami University
rubensjm@muohio.edu
Outline

- Consumer perspective - Why do we buy cars?

- Production/ development of cars - Role of carmaker - supplier relationships

- Role of electronics
It is all about transportation
Or is it?

Stay tuned
First step to the “I-Car”? Stay connected
Why do we buy cars?

As consumers we value:

- Mobility
- Connectivity*

* Some more than others
Outline

- Consumer perspective - Why do we buy cars?
- Production/development of cars - Role of carmaker - supplier relationships
- Role of electronics
A car consists of many parts
Emergence of 5 major subsystems

- Chassis
- Interior
- Exterior
- Powertrain
- Electronics
Assembler-supplier relationships crucial

- Large literature makes that point (e.g. Helper, Dyer, Planning Perspectives annual supplier ratings).

- 3 decades of increased outsourcing established a tiered supply base.

- Today independent suppliers represent nearly $\frac{3}{4}$ of vehicle’s value added.
Outline

- Consumer perspective - Why do we buy cars?
- Production/development of cars - Role of carmaker - supplier relationships
- Role of electronics
  - Electronics and mobility
  - Electronics and connectivity
Today’s car is a network of computers

Example: Airbag electronics

Source: SAE, 2009
Electronics and mobility

- Electronics are being added to all major car systems.
- Applications are geared to enhance performance and safety.
- These changes tend to operate hidden from driver, as they enhance the provision of mobility.
- Example: integration of electric motor and conventional powertrain.
Despite growing electronics content, prevailing assembler-supplier relationships persist.

Traditional parts suppliers, e.g. Bosch, Delphi, Denso, acquire and enhance electronics capability.

Continued central role of OEM. E.g. Toyota holds key patents for hybrid powertrain technology

Examples

- evolution of seats
- from hydraulic brake to “brake by wire”
Connectivity is consumer-driven. It motivates applications, such as navigation systems (Dashboard electronics or telematics).

Connectivity applications tend to originate outside of car (e.g. continue phone call while entering car) and before driving age is reached.

Connectivity resides mostly in vehicle dashboard. It is therefore very visible to the driver. “Apple”, “Google”, “Blackberry” are highly visible brands.
Battleground dashboard

- Big boys of electronics meet big boys of autos
- Who will provide the value added?
  - car makers: all major OEMs
  - parts suppliers: Visteon, Renesas
  - electronic hardware suppliers: Pioneer, Apple
  - software companies: Microsoft, QNX
Supplier relations

- Much faster product cycles in consumer electronics (several generations within ownership spell of car).

- Branding can be powerful (I want to use my i-pod in my car). OEMs pursue similar strategy (MyFord Touch vs MyLincoln Touch).

- Bottom line: At this stage, carmakers do not appear to be in driver’s seat (remember the “i-drive” debacle?).
Electronics content in vehicle is growing fast.

Electronics support two distinctly different applications. Each has different implications for carmaker – supplier relations:

1. Mobility

- Cars have become networks of microchips. Electronics are being integrated into the provision of mobility by way of existing supplier relationships.
2. Connectivity

Today’s driver wants to stay connected while in the car. Cars are becoming extensions of existing electronic devices. Carmakers need to interact with the electronics industry, which moves at a much faster pace. Seamless provision of connectivity by the carmaker can be a powerful branding and differentiation device.
Outlook – will there be an “I-car”?

- Parts of cars have been branded before: Body by Fisher, Hydramatic transmission, Bosch antilock brakes.

- These supplier brands ultimately disappeared (e.g. ABS became a commodity part). The carmaker’s brand has come out on top each time.

- Dashboard electronics might well be different due to the prevalence of non-auto applications. To be continued.
Electronics and assembler-supplier relations

The growing role of electronics in automobiles
Automotive Outlook Symposium Workshop 2011
Detroit, MI
June 2, 2011

Thomas Klier
Senior Economist
Federal Reserve Bank of Chicago
thomas.klier@chi.frb.org
www.chicagofed.org

Jim Rubenstein
Professor
Miami University
rubensjm@muohio.edu