



CHANGING GEARS

THE AUTOMOTIVE INDUSTRY AND RAPID ECONOMIC DEVELOPMENT

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OUTLINE OF THE PRESENTATION

- Background
 - Objective
 - Global Automotive Industry – Key Developments
 - Global Automotive Industry – Key Trends
 - Automotive Industry Development – Comparative Policy Perspective
 - Conclusion
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BACKGROUND

SETTING THE STAGE

DEVELOPED COUNTRIES CONTEXT

- Benefitted from inventions
- Pushed the boundaries of production
- Advanced technological capabilities
- Relative lack of competition

DEVELOPING COUNTRIES CONTEXT

- Learning and imitating impetus
- Mastering the niche market
- Intense competition

PATH TO DEVELOPMENT

- State guidance needed
- Target a specific industry
- Automotive industry holds the key

CRUCIAL CHARACTERISTICS OF AUTOMOTIVE INDUSTRY

- Widespread linkages with all sectors of the economy
- Technology plays a key role in automotive production processes
 - ➔ Key to industrialization: master technology and develop linkages

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OBJECTIVE

OBJECTIVE

- To propose a viable path and identify an industry that can bring about rapid economic development for developing countries
- How:
 - Identifying role of the automotive industry in transformation of society
 - reviewing key trends in the evolution of the industry
 - taking a first comparative look at policy in developing countries



GLOBAL AUTOMOTIVE INDUSTRY

KEY DEVELOPMENTS



AUTOMOTIVE INDUSTRY TRANSFORMATION

- 3 major transformations that impacted competition:
 - Mass Production and moving assembly line.
 - Rise of the European elegant and mid size cars.
 - Design of Just-In-Time production system by Ohno.
- 4th transformation:
 - Diffusion of microelectronics.

EVOLUTION OF THE AUTOMOTIVE INDUSTRY - I

- 1st industrial revolution ➡ steam powered automobile in the 18th century
- Gas powered automobile introduced in early 19th century
- Gasoline powered automobile appeared in late 19th century
- Core mechanical technology developed by 1930s, refinements since

EVOLUTION OF THE AUTOMOTIVE INDUSTRY - II

- Manufactured as a craft in the late 1890s
- Novelty items
- Labour and time intensive production process
- Inefficiency and waste

EVOLUTION OF THE AUTOMOTIVE INDUSTRY - III

- Ford utilized push and move system in early 20th century
- Labour intensive
- Less inefficiency and waste

BRINGING THE WORK TO THE MAN – THE MOVING ASSEMBLY LINE

- Standardized parts
- Homogeneous products
- First use at Ford Motor Co., spillovers in the industry and economy subsequently

THE AFTERMATH

- Ford mass produced one standard model at a cheap price.
- General Motors produced better quality automobile in greater variety.
- Focus not on technical innovation but offering variety (aesthetic innovation).

➡ Late comer firms can thrive in a market.

JUST IN TIME MANUFACTURING

- Introduced by the Japanese
- Focus on maximizing efficiency
- Focus on reducing waste and inventory buildup
- Inspired by the supermarket model of operation

LEAN PRODUCTION SYSTEMS

- Computer controlled production lines coupled with robot assembly.
 - Flexible and modular approach to manufacturing.
 - Replacement and expansion of modules.
- ➡ Movement up the value chain by newcomer firms.

PRODUCTION SYSTEMS COMPARISON

	Characteristic	Production System		
		Lean	Mass	Craft
1.	Labour	Variable skilled	Unskilled; semi-skilled	Highly skilled
2.	Labour Tasks	Variable within cell	Limited; fixed	Variable
3.	Material Stock	Small	Large	Large
4.	Lot Size	Small	Large	N/A
5.	Hierarchy	Decentralized	Central; top down	N/A
6.	Capital Equipment	General purpose	General purpose	Specialized
7.	Product Design	Simple; customizable	Simplified; standardized	Complex; one of a kind
8.	Manufacturing Focus	Quality	Quantity	N/A

Source: Compiled by author from various sources

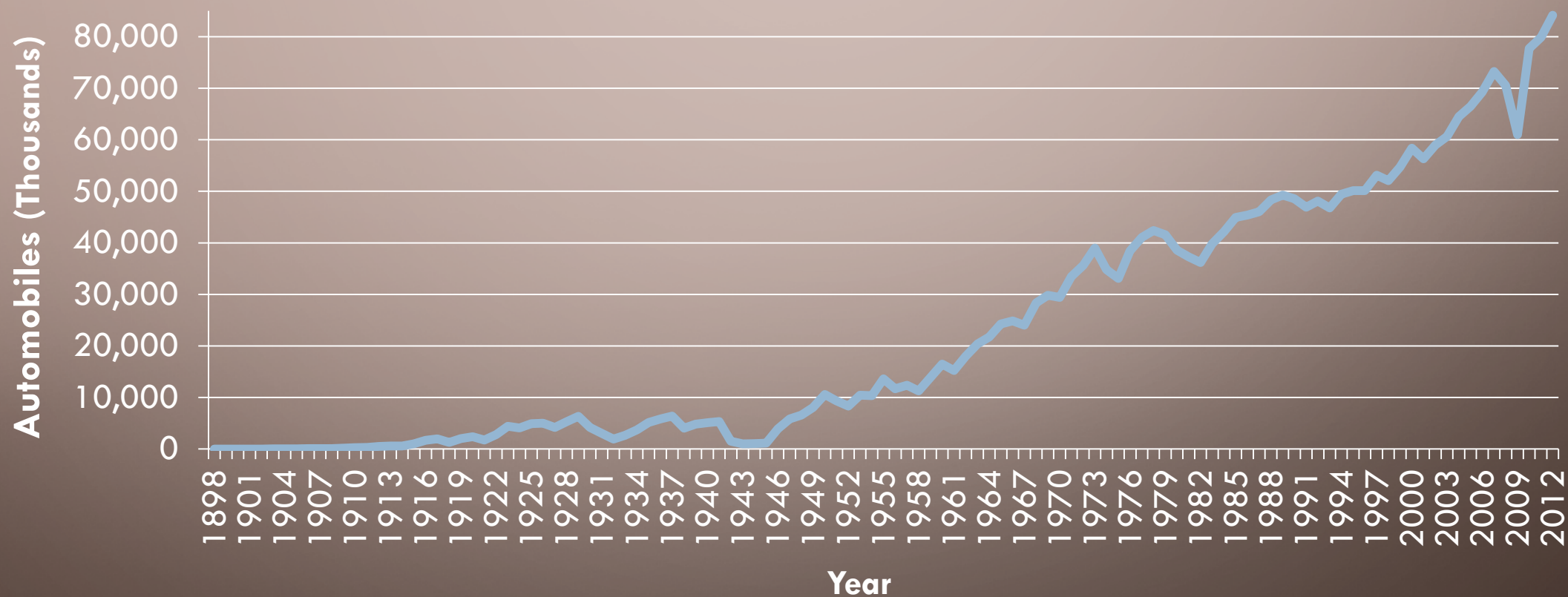


GLOBAL AUTOMOTIVE INDUSTRY

TRENDS



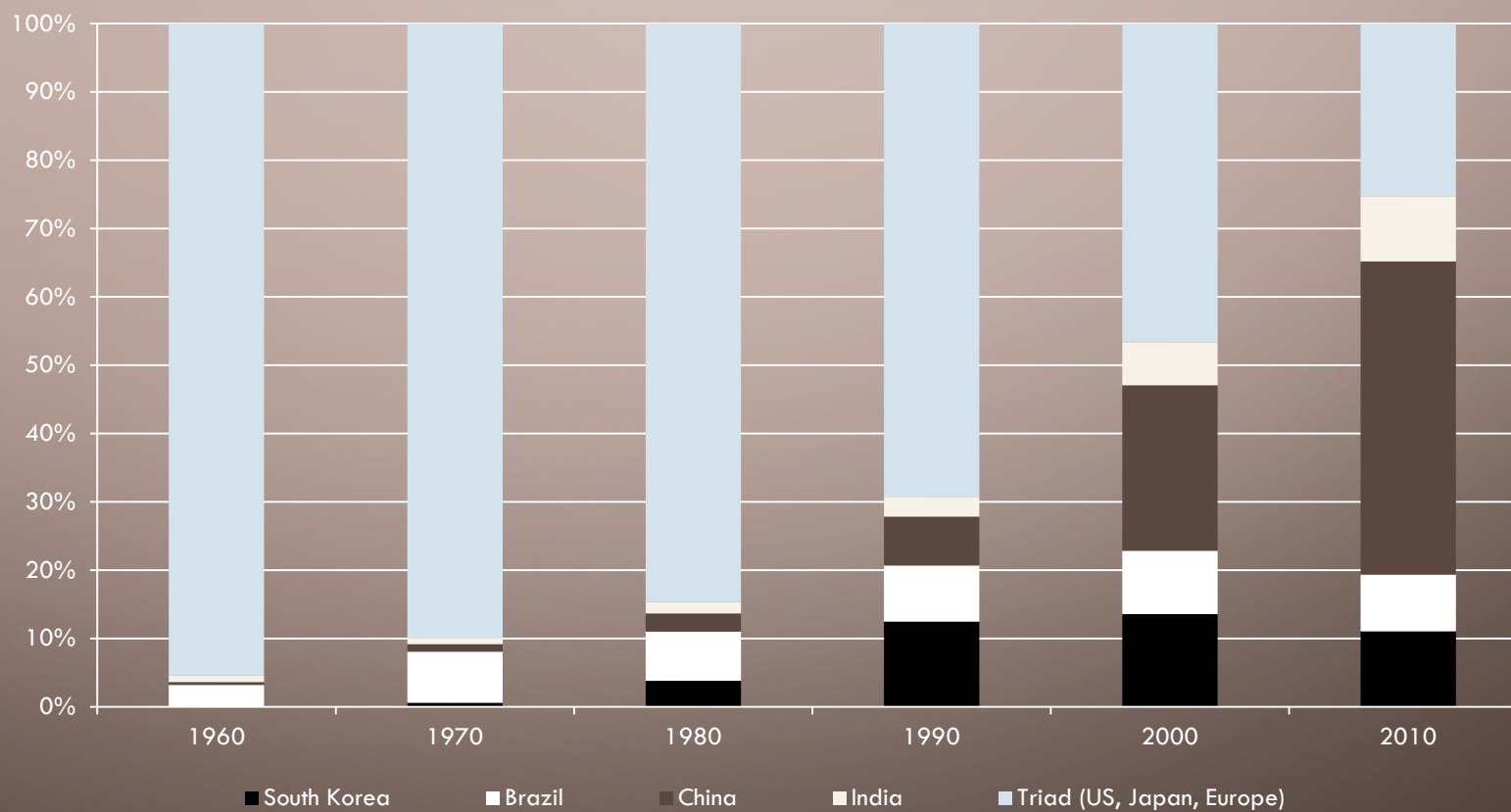
WORLD AUTOMOBILE PRODUCTION (1898-2012)



Main sources: WMVD, SMMT, JAMA, IRF, CCFA, OICA websites

Elaboration: Freyssenet (2007)

PRODUCTION SHARES: MAJOR MANUFACTURING REGIONS BY DECADE (1960-2010)



Source: OICA

SALES SHARES: MAJOR REGIONS (2006-12)

Region	2006	2007	2008	2009	2010	2011	2012
Europe	0	0	-1	-11	-12	1	-10
Russia, Turkey and Other							
Europe	13	16	13	-44	12	24	0
America	-4	-3	-7	-13	-2	5	5
NAFTA	-5	-7	-12	-17	-3	5	7
Central and South America	8	20	14	4	3	4	-2
Asia/Oceania/Middle East	4	4	8	22	9	-3	3
Africa	13	-4	0	-4	-6	4	0

Source: Veloso & Kumar (2002)

The background is a solid dark brown color. In the four corners, there are abstract, light-colored lines that resemble circuit traces or stylized tree branches. These lines end in small circles, creating a decorative frame around the central text.

AUTOMOTIVE INDUSTRY DEVELOPMENT

A COMPARATIVE POLICY PERSPECTIVE

CURRENT SCENARIO

- Rapid development of industry required
- Technological capabilities development required
- Policies aimed at supporting industrial development

BRAZIL - POLICY

- Weak industrialization experience initially
- Automotive industry selected as core industry in 1956
- Foreign MNC led industry development
- Policy instruments:
 - Import tariffs
 - Exchange rate adjustment, protectionist policies
 - FDI incentives

BRAZIL – POLICY OUTCOME

- Scale economies achieved
- Local technological development lagging
- Limited spillovers to the domestic economy
- Control of almost 95 percent industrial assets with foreign firms

MALAYSIA - POLICY

- State-led automotive industry development
- Viable domestic automotive industry desired
- Dedicated to National Auto Programme
- No performance based criteria enforced

MALAYSIA – POLICY OUTCOME

- Domestic firm, Proton, achieved measure of success at high cost
- No focus on imitation, learning across the board
- Limited impact on having JV Partner develop domestic capabilities
- Locally designed automobile model launched within two decades

THAILAND - POLICY

- Aim: to become Detroit of the East
- MNC led growth
- Instruments:
 - Favourable exchange rates
 - Liberal trade regime
 - Non-confrontational trade-unions

THAILAND – POLICY OUTCOME

- Conflict of interest between state's desires and MNCs goals
➡ limited success of plan
- Thai suppliers relegated to lower tier status
- MNC suppliers achieved first tier status
- Fragmented unions unable to coordinate and bargain

SOUTH AFRICA - POLICY

- Protected industry till 1980s (import led substitution)
- Local content requirement enforced
- Exorbitant import tariffs on components imposed for non-compliance

SOUTH AFRICA – POLICY OUTCOME

- Initially inefficient and inward oriented production process
- Large number of models in low volume and high cost
- Low quality, outdated design specifications and inefficient supplier chains

PAKISTAN - POLICY

- Import led substitution in early days of industrialization
- Focus on assembly of automobiles, consumer durables and capital goods
- Policy instruments:
 - Concessional rates of duty on imports
 - Deletion policy
 - Tariff Based System (post 2006)

PAKISTAN - POLICY

- Automobile Industry Development Programme launched
- Designed to:
 - help industry achieve critical mass of production
 - Double contribution of industry to GDP
 - Increase exports
- Outcome: targets have not been achieved

PAKISTAN – POLICY OUTCOME - I

- No reward, only penalties for indigenization failures
- Accelerated indigenization of simple components
- Production concentration on lower end of manufacturing tier

PAKISTAN – POLICY OUTCOME - II

- Large profit margins at assembly stage
- Profits found to decline with progressive parts manufacturing

➡ Unsustainable system creating weak capabilities

PAKISTAN – POLICY OUTCOME - III

- Crucial and relatively complex components:
 - not produced locally
 - Not included in deletion list
- Indigenization programme focused on components
 - ➔ limited scope for backward linkages with rest of the economy

PAKISTAN – POLICY OUTCOME - IV

- Industry segments that met or came close to achieving indigenization targets:
 - Tractors
 - Motorcycles
- Industry segments unable to reach targets:
 - Passenger cars
 - Buses and trucks

AUTOMOTIVE INDUSTRY AND TECHNOLOGICAL CAPABILITIES DEVELOPMENT

	Led By	
	Domestic Industry	MNC Firms
Brazil		Very limited success
Thailand		Some success
Malaysia	Limited success	
South Africa	Some success	
Pakistan	Some success	

Source: Compiled by author from various sources



CONCLUSION

FINAL THOUGHTS

- Automotive industry is the mother of all industries
- Has been responsible for rapid transformation of numerous societies
- Future advances in the industry will also be beneficial for developing countries
- Developing countries can make effective use of the industry

FINAL THOUGHTS

- Industry specific policies accelerate industrial development
- Policy is focused either on domestic led or MNC led industry development
- Comparative look at different policies and outcomes will yield lessons

FINAL THOUGHTS

- MNC led growth not categorically better than domestic firm led growth or vice versa
- One size fits all policy will not work
- Industry specific policies have worked and can work in future
- In depth analysis of domestic industry is required