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ECN 145 Lecture 7



**Transportation Economics:  
China's Entry to the WTO –  
A View from the Auto Industry**

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WTO Changes for the Auto Industry:

**Import Tariffs**

- Current: 80-100% on passenger cars; as low as 9% on some other vehicles
- WTO: Reduced to 25% for passenger cars by 2006

**Distribution**

- Current: Car manufacturers must use Chinese distributors to sell their vehicles
- WTO: Distribution rights for foreign firms phased in over three years

**Finance**

- Current: Chinese consumers have difficulty financing a vehicle purchase using domestic bank loans
  - WTO: Foreign firms can provide auto financing by 2005
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## WTO Accession will place pressure on the domestic Chinese auto industry

- **Quality must increase – and it has**
  - GM's Buick assembly line is state-of-the-art
  - Other JVs have upgraded their manufacturing technology and product quality
- **Costs must come down – but they will**
  - JV executives maintained that squeezing at most 25%-30% out of their manufacturing costs would enable them to remain price competitive with imports

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## Barriers to imports will remain post-WTO

- **Most managers on the ground expect imports to increase**
- **Every manager on the ground expects non-tariff barriers to limit import penetration**
  - 10-15% market share for imported cars
- **Domestic demand for cars will continue to be supplied principally by domestic suppliers**

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WTO Accession is expected to give JV manufacturers a freer hand

- **Will obtain greater control over distribution and after-sales service**
- **Will be able to offer consumer financing (but cannot repossess vehicles)**
- **Can deal more freely with the local supplier base (but expect to source heavily from local suppliers)**
- **No plans for significant “delocalization” of sourcing parts**

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The consensus is that demand for cars will continue to grow slowly

- Most JV manufacturers expect the slow growth of the late 1990s to continue into the medium-term future
- The official statistics suggest that household income is growing much more slowly than the economy
- Official government projections extrapolate the growth of domestic production over the last five years into the next five (13% compound growth rate)
- **The outlier: GM**
  - Historical studies suggest that the mass market for automobiles “takes off” when per capita income reaches a threshold level
  - “Urban coastal China” is at or very close to this level
  - Other studies are less optimistic

## JV Selected Model Prices 2001

Brand	Market Share in 2000	Average Purchase Price May 2001 (Beijing/Tianjin)	
Santana	18.2%	RMB 118,500	(\$14,300)
Santana 2000	13.5%	RMB 135,000	(\$16,300)
Jetta 2V	13.3%	RMB 115,000	(\$13,900)
Alto	8.9%	RMB 49,500	(\$ 6,000)
Charade 7100U	6.4%	RMB 67,600	(\$ 8,200)
Accord	5.3%	RMB 290,800	(\$ 35,120)
Buick	5.0%	RMB 350,000	(\$ 42,300)
Audi A6	2.6%	RMB 441,000	(\$ 53,300)

Source: China Business Update Autostatistics, 2001

## Taxes and fees are *extremely* high

- **The cost of acquiring a car in Shanghai**
  - Direct cost is \$10,000 (up to \$40,000 for Buick)
  - Driver's license cost \$500 (plus 2 months of intensive training/testing)
  - 8% consumption tax: \$800
  - Registration fee: \$2,500
  - 17% vat: \$1,700
  - Other operating costs (fees, tolls, etc.)
  - Fuel costs are comparable to the US
  - Per-capita income: < \$4,000 per year

Source: ITS-Davis Pew Study, 2001

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**Data and history are on the side of the pessimists**

Country/Era	Price of mass-consumer vehicle	Per capita GNP	Ratio of price to per capita GNP
1920s US	650	850	.76
1960s US	2500	3000	.83
China (nominal)	10000	750	13.3
China (PPP)	10000	3500	2.57
Shanghai (PPP)	10000	10000	1

Source: Harwit, CAJ, April/May 1999

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**Roadways are congested and parking is limited**

City	Total Population	Number of parking spaces	Ratio of Population to Parking Spaces
Portland	450,000	42,000 (1996)	11
Frankfurt	625,000	85,000 (1989)	7
Beijing	11,000,000	360,000 (1998)	31
Guangzhou	6,000,000	10,000 (1994)	600

Source: Harwit, CAJ, February/March 1999

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## Growth in demand concentrated at the low end

- Official government plans now focus on the 80,000 RMB car (about \$9,700)
- All JVs are seeking to introduce “economy models”
- Most JV production has been forcibly steered toward the higher end, requiring substantial retooling

Source: CBU translation of 5-year plan for automotive industry

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## The Agricultural Vehicle Market

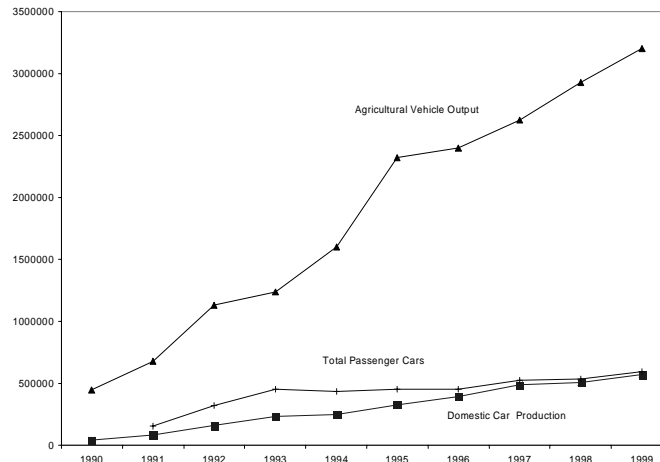
- **What is an agricultural vehicle?**
  - 3-wheeled or 4-wheeled vehicles produced primarily for the rural market
  - Powered by small diesel engines (700cc – 1.7l)
  - Restricted in terms of length, width, height, speed, and not allowed in urban areas, but exempt from licensing and other controls applied to cars, buses, and trucks
  - Provide cost-effective transportation for farmers and other rural residents
    - 3-wheeler cost: \$610 - \$975
    - 4-wheeler cost: \$1,220 - \$3,660

Source: ASIMCO market research

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## AV sales are growing rapidly

Agricultural Vehicle Output Versus Car Output, 1991-1999



Source: ASIMCO market research

## Are AVs the future?

- **AVs are inexpensive, labor-intensive, low-tech products that rural workers can afford**

- “The agricultural vehicle is already China’s family car, our Model T” Lu Zaihou, ASIMCO
- “Domestic producers can make a profit selling 4-wheel agricultural vehicles for US \$3,000 or less, while global assemblers generally find it difficult to make a profit on vehicles sold for three to four times as much” Jack Perkowski, ASIMCO
- Upgrading by the domestic producers of these vehicles could create “competition from below” for the JV manufacturers

- **But the government could legislate them out of existence**

- These vehicles are highly polluting, low-tech, and not very safe
- They do not correspond to the government’s vision of a “world class automobile industry”

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## The Government's Vision for 2005

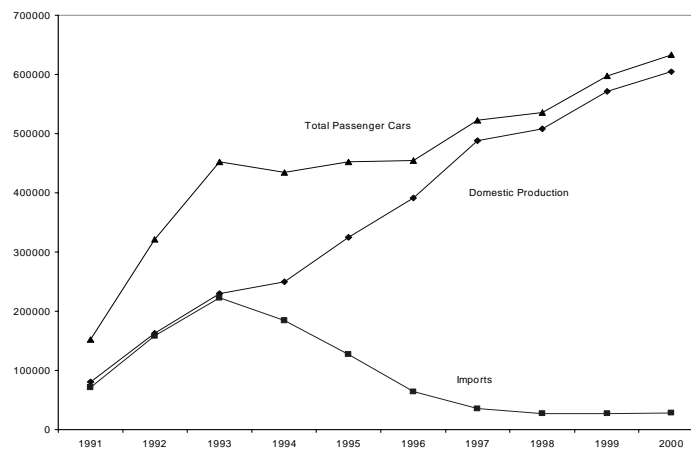
*The 5-Year Plan for the Automotive Industry*

- Steady, but not explosive growth through 2005
  - Domestic producers will continue to dominate the market
  - Consolidation of auto assembly, auto parts, and motorcycle production into a small number of dominant enterprise groups
  - Extensive technology upgrading
  - Belief in the market potential of rural China, the Western regions
  - The state will continue to play a strong guiding role in the evolution of the industry
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## Growth in domestic production has come at the expense of imports

Imports, Domestic Production, and Total Output, 1991-2000



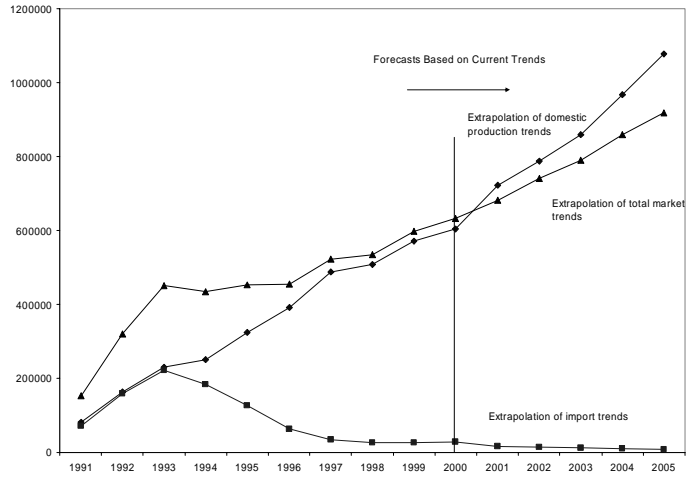
Sources: 1999 China Automotive Industry Yearbook, CATARC press, Tianjin, 2000, and China Auto Consulting

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There is no room in the government's forecast for import growth!

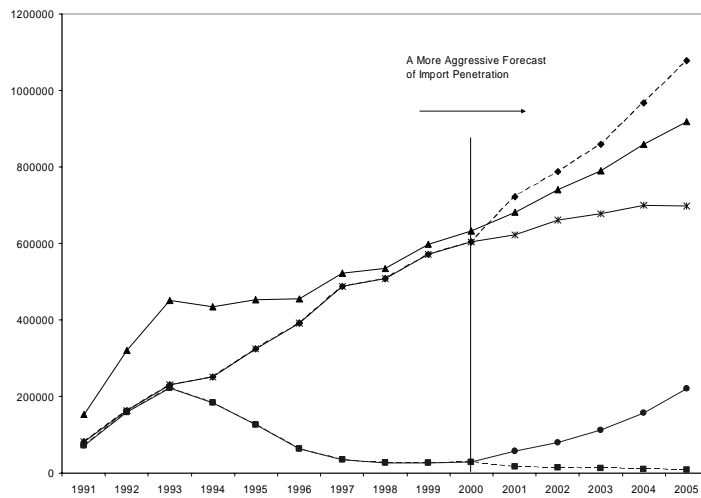
Projecting Current Trends to 2005



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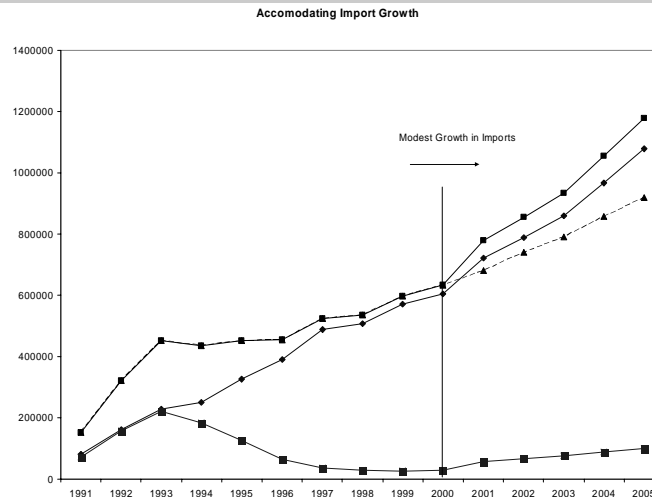
To accommodate even modest growth in imports, domestic production will have to fall ...

An Alternative Projection to 2005



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## Or the total market will have to grow *much* faster



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## Tensions in the government plan

- **Environmental concerns versus industrial development**
  - Industrial development wins
- **High technology versus appropriate technology**
  - Persistent tendency to “push” advanced technology
  - Short shrift given to the potential of agricultural vehicles
- **Rhetoric versus reality on industry consolidation**
  - The theme of necessary consolidation is relentlessly emphasized
  - But this was true in earlier industry plans
- **Policies to stimulate demand**
  - Government recognizes the problem, but poses no concrete solutions
- **Free market versus government control**
  - Government will still play a strong role in steering the development of the automobile industry after the implementation of WTO
  - Noneconomic state objectives are explicitly emphasized: development of indigenous design capability

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The multinationals will *not* push for a greater opening to exports

- **Most major manufacturers have been induced to purchase a stake in the protected pre-WTO market**
- **A “de facto VER” would arguably be in the best interests of company profits**
  - Chief beneficiaries of a free market would be *Korean* manufacturers
- **This gives the Chinese government political cover to delay the opening of the market at the expense of consumers**

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Empirical analysis conducted to date

- **Empirical analysis using registration data**
  - Breakdown by province, year, production model
  - Publication of these data ceased in early 1990s
- **Empirical analysis using import data**
  - Detailed customs data available from late 1980s through late 1990s
  - Can be used to model import demand

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## Regression of log quantity demanded on:

	<b>Inexpensive Import Q</b>	<b>Mid-range Import Q</b>	<b>Luxury Import Q</b>
<b>Inexpensive Import price</b>	<b>.346</b> (.411)	.629 (.270)	-.119 (.206)
<b>Midrange price</b>	.934 (.180)	<b>-4.17</b> (1.05)	-1.50 (.751)
<b>Luxury price</b>	-.846 (.592)	-1.72 (.379)	<b>-.885</b> (.294)
<b>Vehicle stock</b>	.461 (.524)	-.026 (.343)	.903 (.254)
<b>Per capita GDP</b>	<b>37.7</b> (6.30)	<b>7.52</b> (4.02)	<b>3.35</b> (2.97)

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## Income Effect

- **As income increases, how will auto demand change?**
- **These income effects have been estimated for the three sizes of imports**
- **(Regression estimates on previous slide)**
- **We can use these to simulated the effects of provincial growth in income per capita**

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## Estimated Percentage Change of Passenger Car Imports

	Elasticity on per capita GDP	Growth of Income per Capita		
		20%	50%	100%
Inexpensive Imports	23.5	470%	1175%	2350%
Mid-ranged Imports	4.3	86%	215%	430%
Luxury Imports	0	0%	0%	0%

**Note:** Calculation based on author's log-linear regression estimates with year and province fixed effects.

In the past decade, 20% growth occurred in two years;  
50% growth occurred in four years;  
100% growth occurred in six years.

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## Growth of Per Capita GDP (\$), 1988-98

	1988	1998	Growth
Beijing	781	1,950	150%
Tianjin	634	1,687	166%
Jilin	302	712	136%
Shanghai	1,093	3,043	178%
Guangdong	381	1,339	251%
Sichuan	180	524	191%
coastal	388	1,282	230%
Inland	205	589	188%
Total	264	811	207%

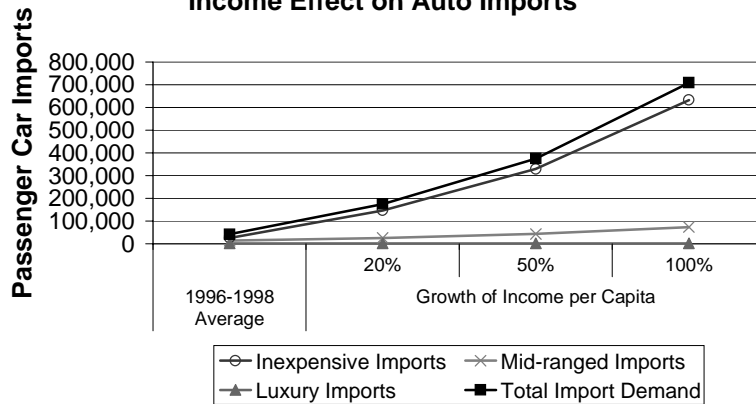
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Income Effect on Passenger Car Imports-  
Change in Quantity

Import Demand	1996-1998 Average	Growth of Income per Capita		
		20%	50%	100%
Inexpensive Imports	25,816	147,200	329,200	632,500
Mid-ranged Imports	13,948	25,900	43,900	73,900
Luxury Imports	2,212	2,200	2,200	2,200
Total Import Demand	41,976	175,300	375,300	708,600

**Note:** In the past decade, 20% growth occurred in two years;  
50% growth occurred in four years;  
100% growth occurred in six years.

Income Effect on Auto Imports



Income Effect on Passenger Car Imports-  
Change in Market Share

Share of Import Demand	1996-1998 Average	Growth of Income per Capita		
		20%	50%	100%
Inexpensive Imports	0.62	0.84	0.88	0.89
Mid-ranged Imports	0.33	0.15	0.12	0.10
Luxury Imports	0.05	0.01	0.01	0.00
Total Import Demand	1.00	1.00	1.00	1.00

Estimated Percentage Change of Imports, if Tariff  
Cut by 60%, Equivalent to a 33% Price Cut

	price elasticities	% change of imports
Inexpensive Imports	0	0%
Mid-ranged Imports	-3.10	102%
Luxury Imports	-0.95	31%

Note: Calculation based on author's log-linear regression estimates with year and province fixed effects.

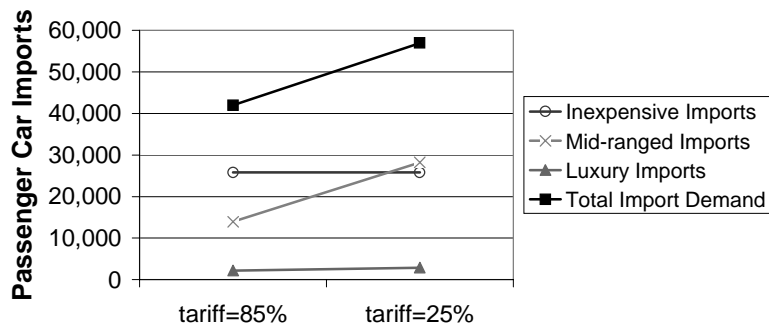
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The Effect of a 60% Tariff Cut On Passenger Car Imports –Change in Quantity

Import Demand	1996-1998 Average	Car Imports After Tariff Cut
Inexpensive Imports	25,816	25,800
Mid-ranged Imports	13,948	28,200
Luxury Imports	2,212	2,900
Total Import Demand	41,976	56,900

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The Effect of a 60% Tariff Cut On Passenger Car Imports -Quantity



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The Effect of a 60% Tariff Cut On Car Imports-  
Change in Market Share

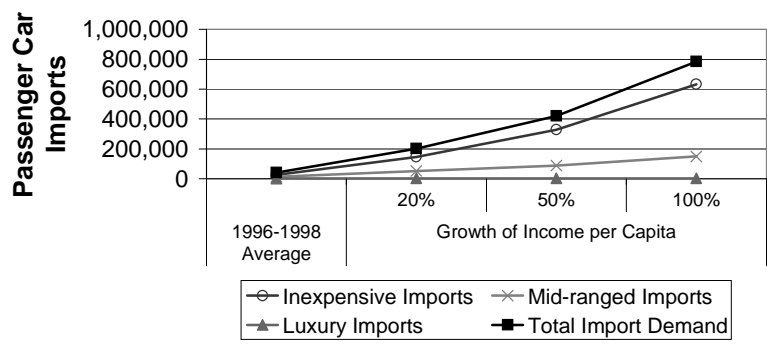
Share of Import Demand	1996-1998 Average	Car Imports After Tariff Cut
Inexpensive Imports	0.62	0.45
Mid-ranged Imports	0.33	0.50
Luxury Imports	0.05	0.05
Total Import Demand	1.00	1.00

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Combined Income Effect on Passenger Car Imports  
With a 60% Tariff Cut - Change in Quantity

Import Demand	1996-1998 Average	Growth of Income per Capita		
		20%	50%	100%
Inexpensive Imports	25,816	147,200	329,200	632,500
Mid-ranged Imports	13,948	52,500	88,900	149,500
Luxury Imports	2,212	2,900	2,900	2,900
Total Import Demand	41,976	202,500	420,900	784,900

**Income Effects on Auto Imports With a 60% Tariff Cut**



**Income Effect on Passenger Car Imports With a 60% Tariff Cut-Change in Market Share**

Share of Import Demand	1996-1998 Average	Growth of Income per Capita		
		20%	50%	100%
Inexpensive Imports	0.62	0.73	0.78	0.81
Mid-ranged Imports	0.33	0.26	0.21	0.19
Luxury Imports	0.05	0.01	0.01	0.00
Total Import Demand	1.00	1.00	1.00	1.00

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## **Conclusions:**

- Combined growth of income (100% over 6 years) and tariff reduction will shift market shares towards inexpensive imports (from 62% to 81%), and raise quantity from 26,000 to 633,000 units.
- Market share of mid-range imports falls (from 33% to 19%), while quantity rises from about 14,000 to 150,000 units.
- Luxury imports remain at about 3,000 units.