

The demand for gasoline in  
Japan to 2020: an new car fuel  
efficiency  
BIEE, 2006

**David Bonilla PhD**  
**Research fellow**  
**Land Economy /4CMR**  
**Cambridge University**

Project financed by EU-commission  
Marie Curie program (2005-2007)

*D. Bonilla Cambridge Univ.*

## Aim of the study

- Examine how renewal of vehicle stock affects gasoline demand taking account of technology ch.
- fuel efficiency effects
- fuel efficiency standards
- Project gasoline demand in near future

## Work in the field

- Sakaguchi (2000) energy policy;
- Johansson-Schipper (1997) trans. Econ. Pol.;
- Kaya (1981) Government Report;
- Deterministic models literature:
- Franzen-Sterner (1995);
- Boone et al. (1995);
- Hunt and Ninomiya (2003) E. Journal.

# Worrying growth of gasoline demand

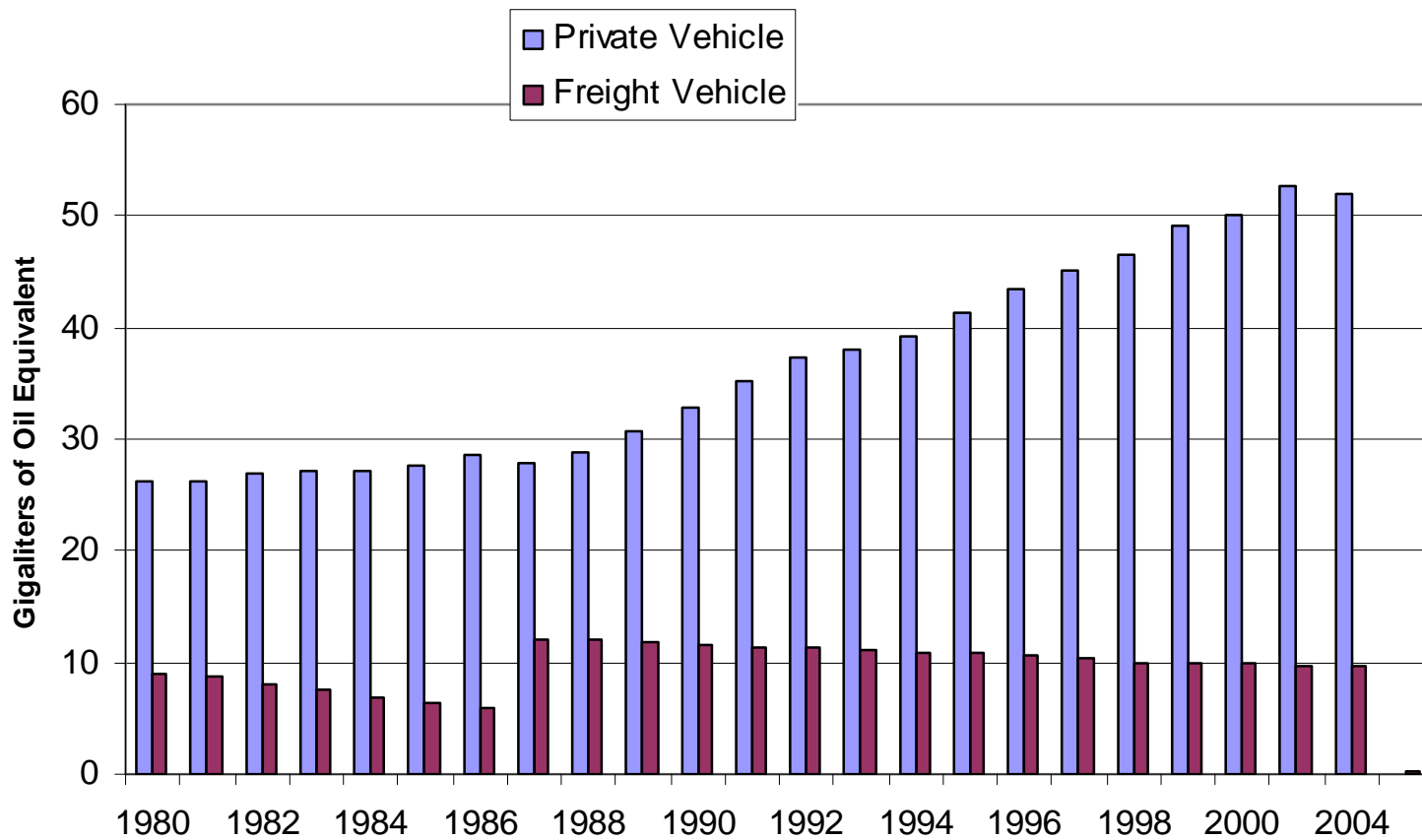


Figure 1. Gasoline demand

# JP gas prices and v-kilometers;

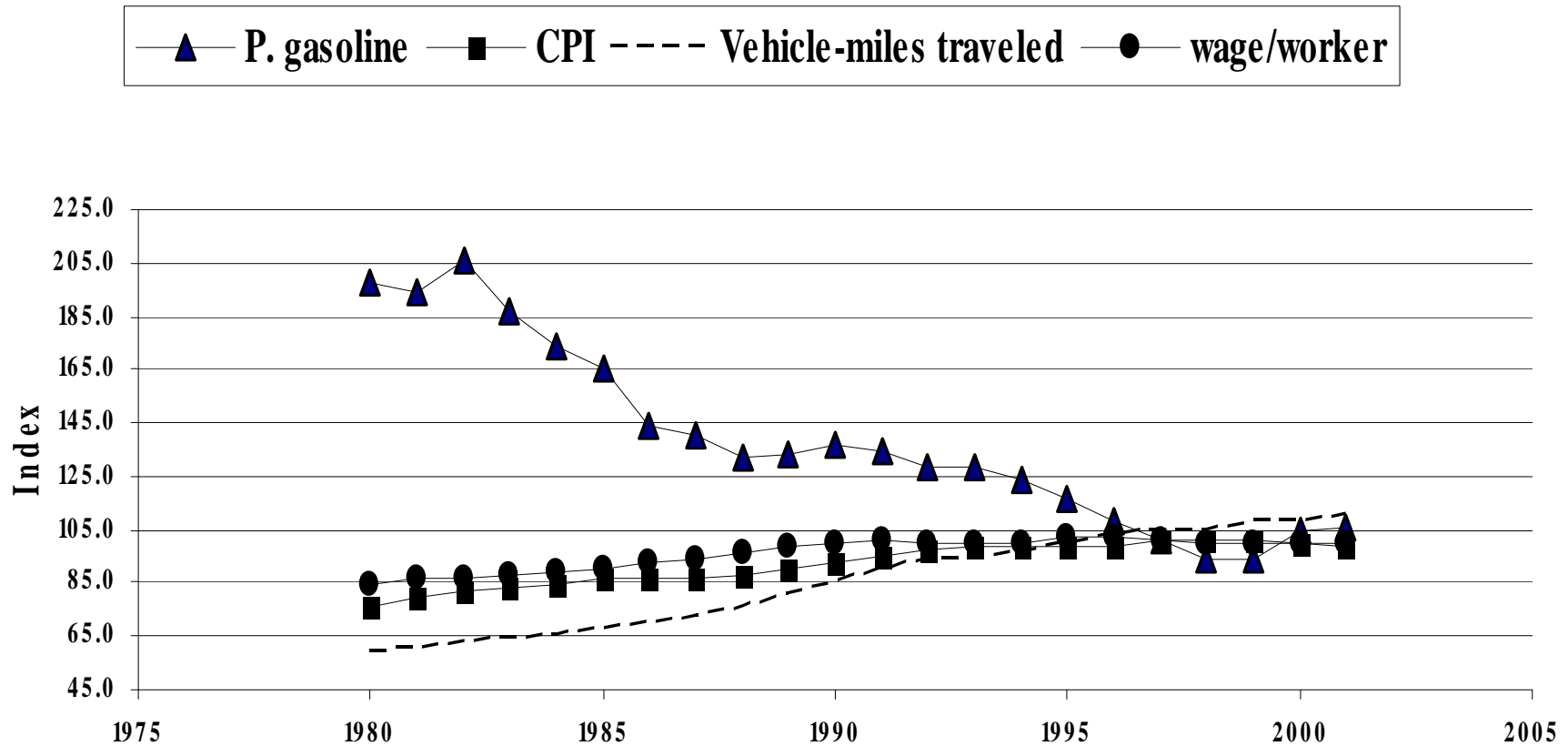
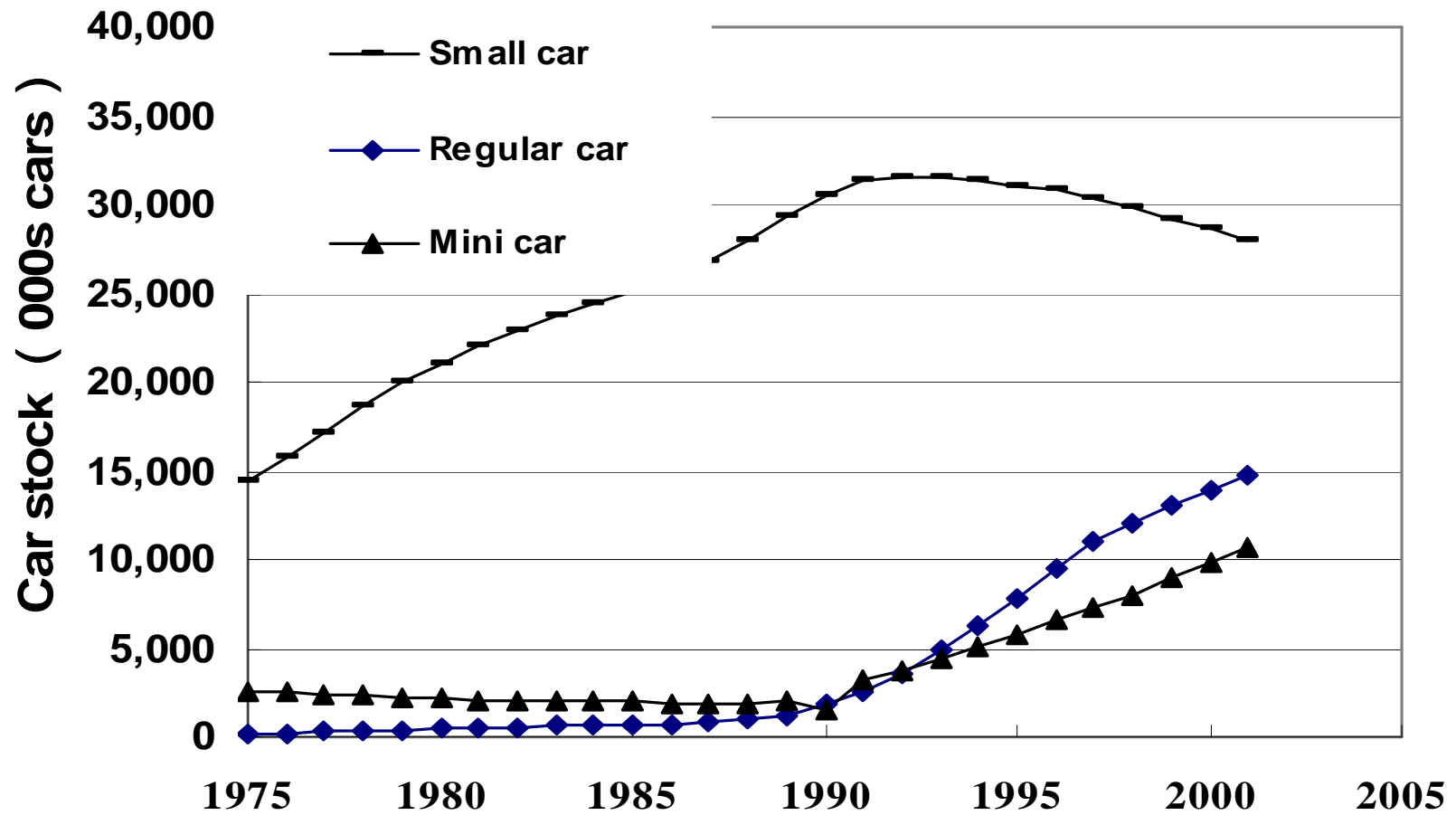


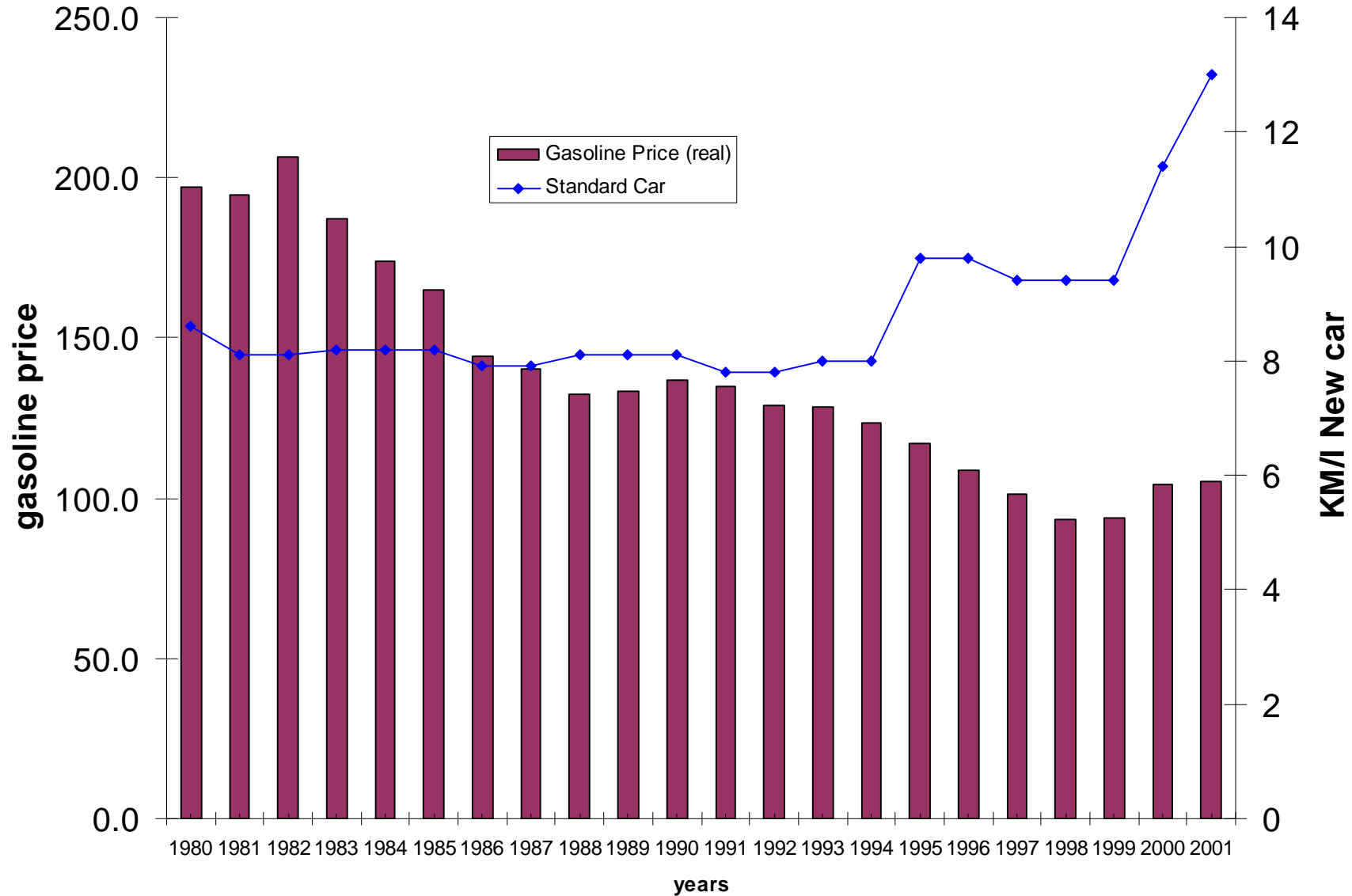
Fig. 3. Gasoline price, activity and income (1995=100)

# JP car stock and minicar stock increase



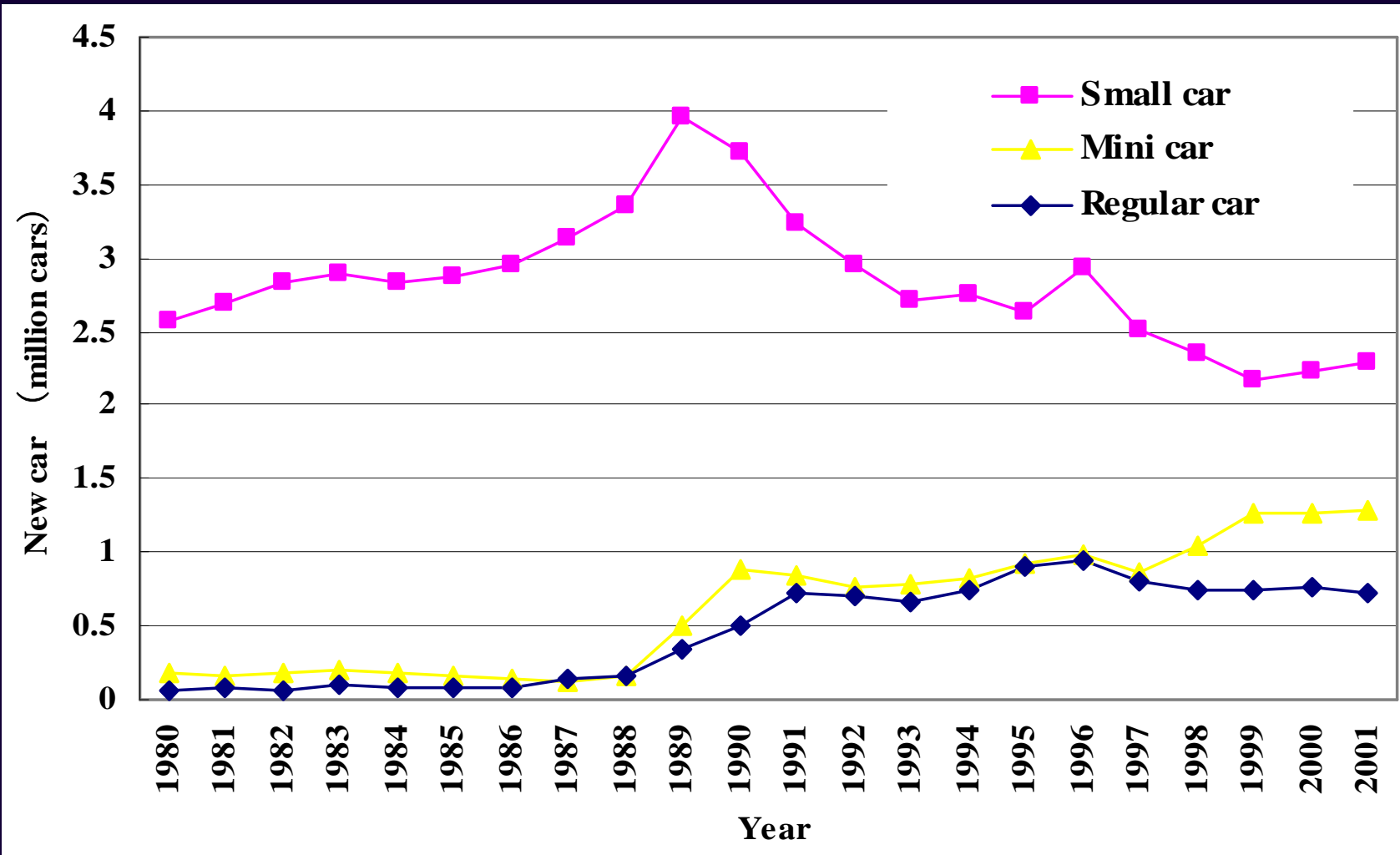
Vehicle stock in Japan

# JP gas price and new car FE

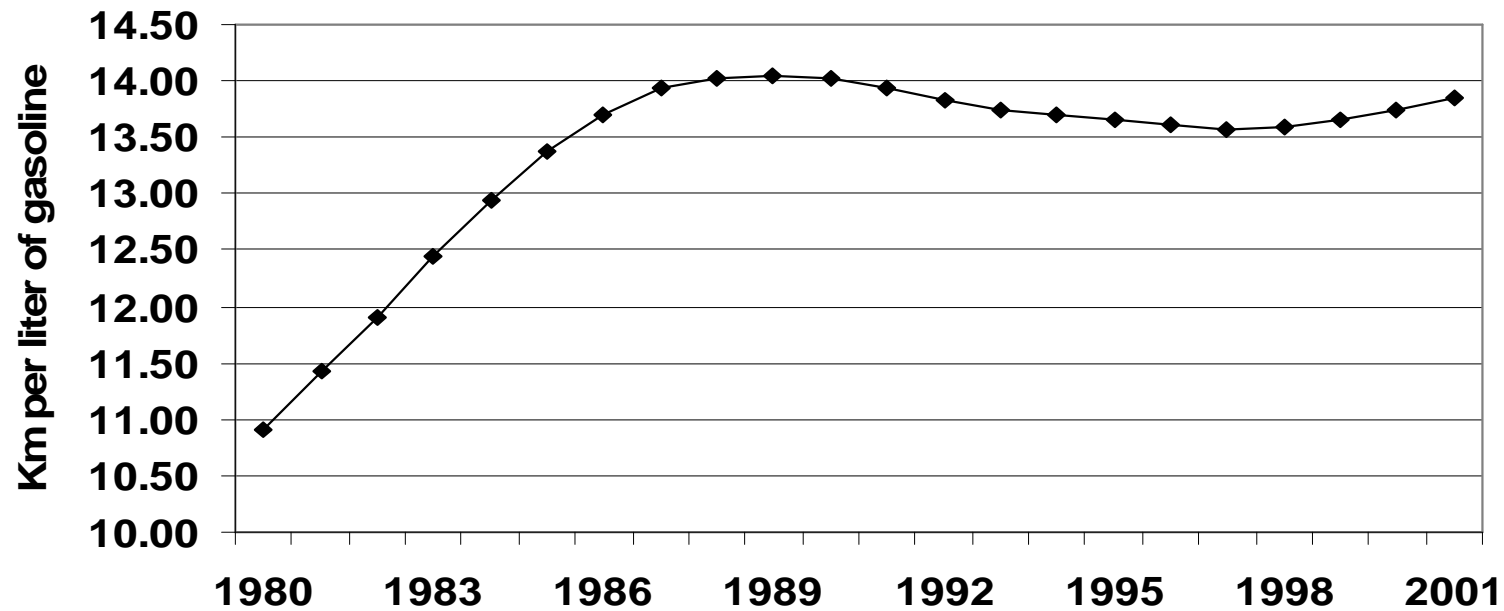




# JP small car sales slow; mini-car market grows

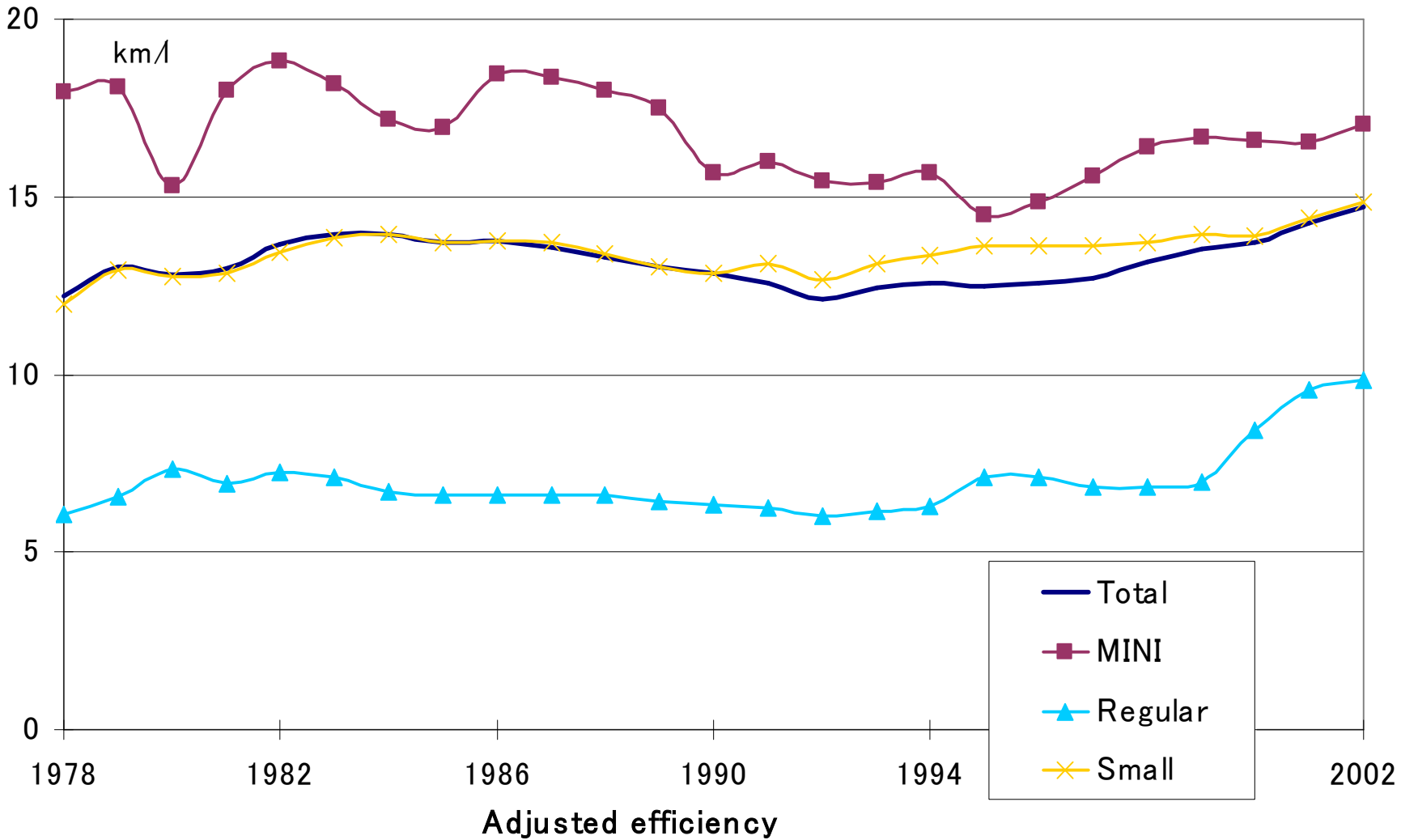


# JP fuel efficiency stagnant in 90's

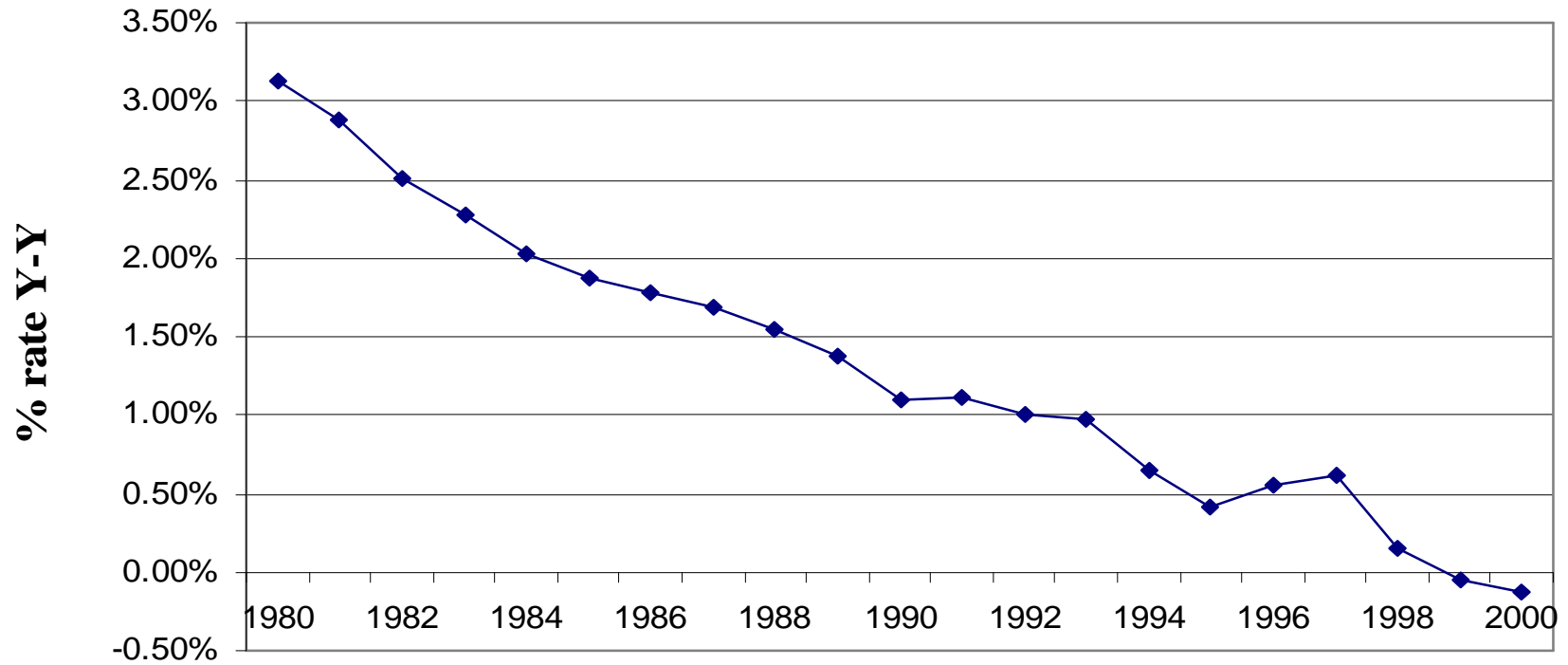


Vehicle fuel efficiency in Japan (private vehicles)

# Assumptions on exogenous variables to project gasoline demand of Japan (sales weighted efficiency)

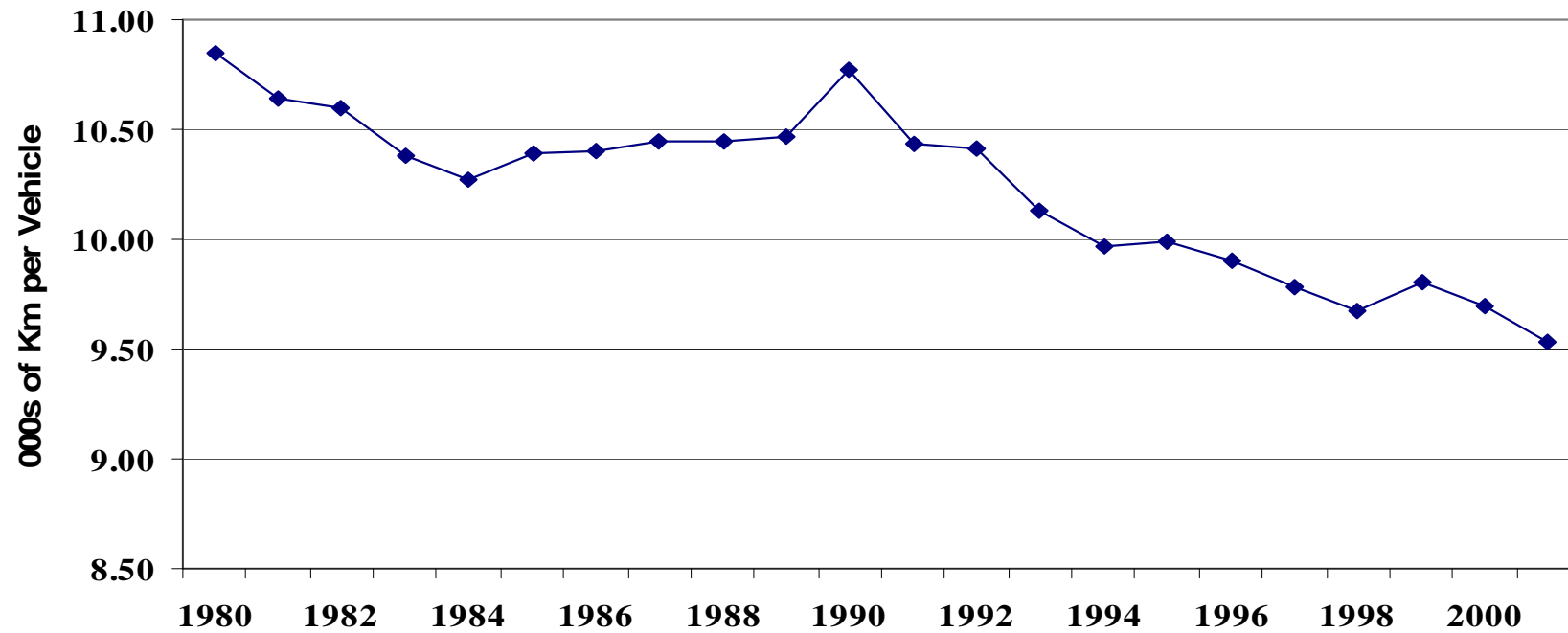


# JP fewer drivers per household compared to late 1980's



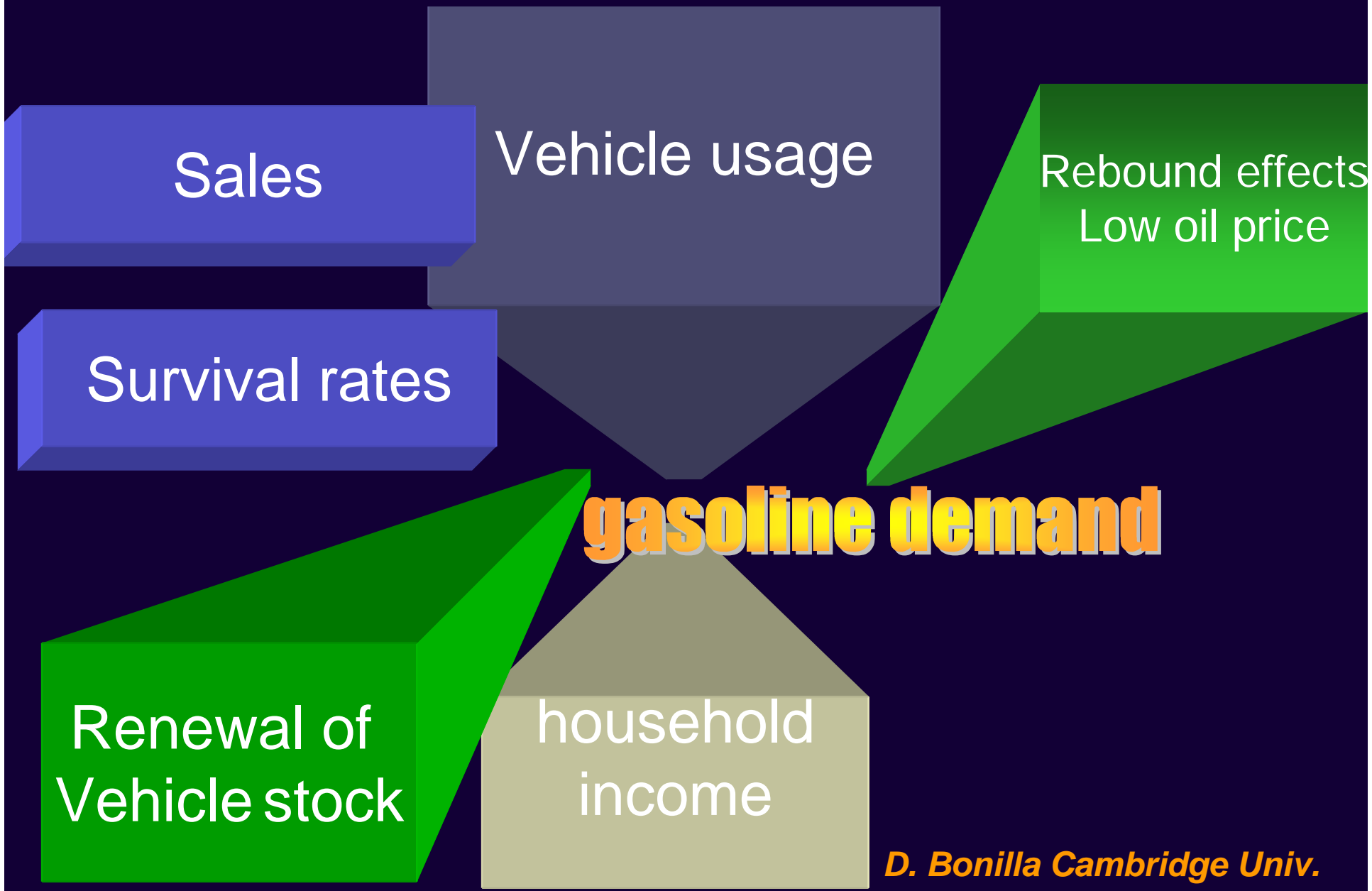
**Declining growth in drivers/household in Japan (1980-01)**

# JP drop in vehicle usage compared to late 1980's



**Falling vehicle utilisation**

# System for modeling gas demand



# New car fuel efficiency

- We find low elasticity of FE to gasoline price (0.06) (using a lagged gasoline price)

# Gasoline demand model

- Utilisation
- Vehicle fuel efficiency (sales weighted)
- Stock effects (3 car types) linked to sales
- Data 1980-2003 (JAMA, IEEJ)



# Predicted effects on gasoline demand

Fuel eff.	2020	Gasoline demand 04-2020 % pa.
NO FE	2002 level	0.83
FE (1% pa.)	16.6	0.11
No FE (High GDP)	13.92	1.5
FE (GDP growth)		0.77

# Projections on gasoline demand 04-2020 % pa

Inst. of Energy Economics (2006).		This study
Reference case	-0.6	0.11
High GDP growth	-0.36	0.77
High oil price	-0.57	-0.40

## Conclusions of the study

- vehicle stock affects gasoline demand
- Unlike others model captures long run effects
- Fuel efficiency linked to vehicle stock
- Scenario
- Fuel eff effects significant
- Cointegration approach needed?