Institute of Transportation Studies
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Consumer Response to Fuel Price Changes: Implications for Policy

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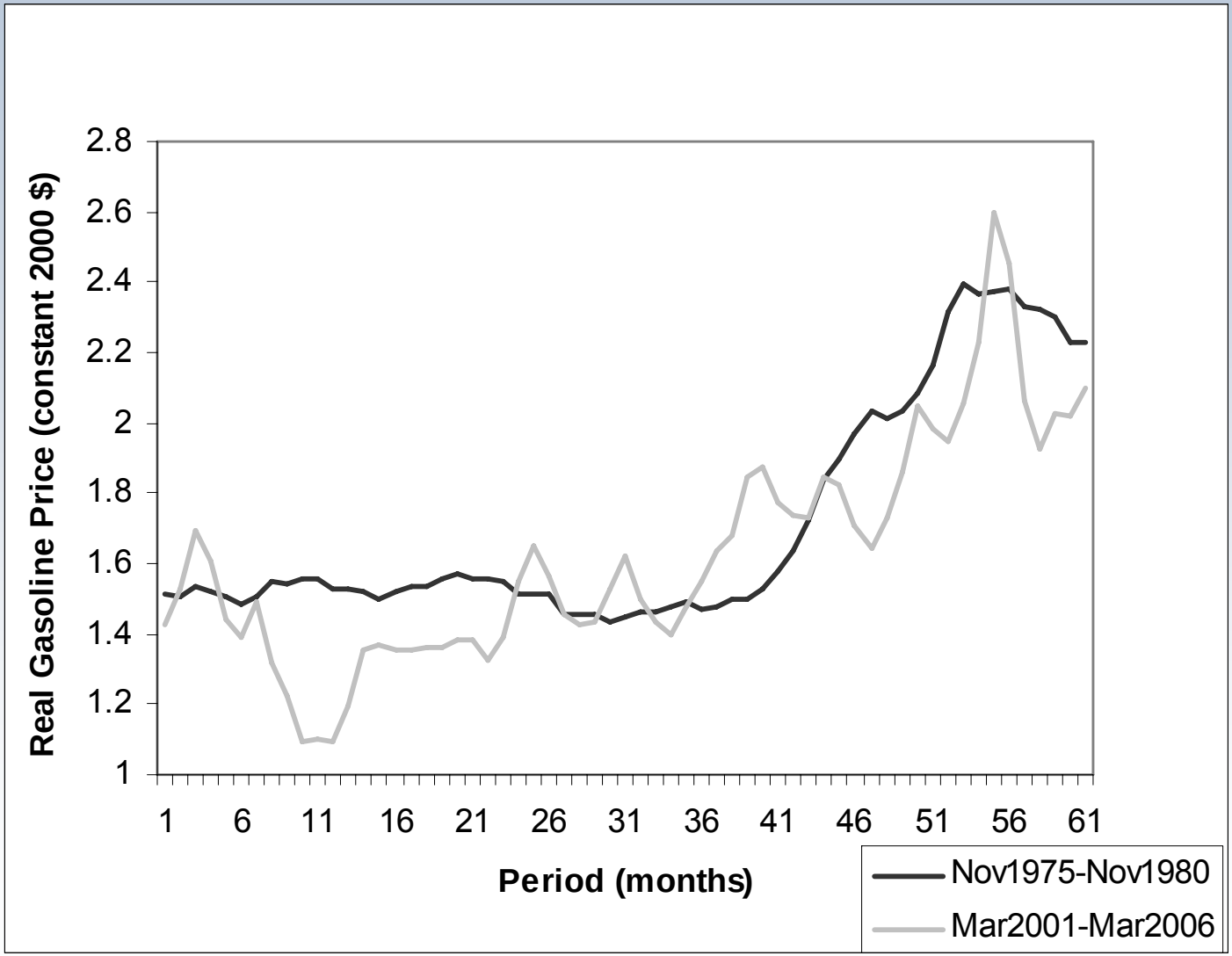
ITS UCDAVIS fifteen years
THE JOURNEY HAS JUST BEGUN

Real Gasoline Prices, 1975-1980 & 2001-2006



Sources: U.S. Bureau of Labor Statistics, Bureau of Economic Analysis

Recent Findings

- **Demand for gasoline is highly inelastic today**
- **Demand is much less elastic than 30 years ago)**
  - **Short term demand elasticity has dropped from about -0.30 in late ‘70s and early ‘80s to less than -0.10 today.**
    - **Small and Van Dender (2007)**
    - **Hughes, Knittel and Sperling (2008)**

(100% increase in gasoline price results in <10% drop in gasoline consumption)

Recent Data Support the Study Findings

Early 2000s: gasoline sales increased 1.7%/yr

When gasoline prices nearly doubled in 2005-2006, the change in gasoline consumption was:

2005: +1.2% (vs +1.7%) → **-0.5%**

2006: -0.3% (vs +1.7%) → **-2.0%**

That is, ~100% increase in price resulted in 2.5% less fuel consumption (below what it would otherwise have been)

This is as inelastic as one can imagine, and consistent with Small& Van Dender and Hughes et al.

Why is Demand Less Elastic?

- **Greater car dependence, resulting from land use sprawl and suburbanization**
- **Decrease in transit availability (related to sprawl)**
- **Less HH flexibility**
  - **Multiple workers**
- **Improved vehicle fuel economy and higher income**
  - **Fuel cost is smaller share of income**
- **Drivers don’t expect prices to continue rising (as they did in ’75-’80)**
- **No concern about fuel availability and long lines at fuel stations (as there was in ’75-’80)**

Elasticities Greater in Long Term?

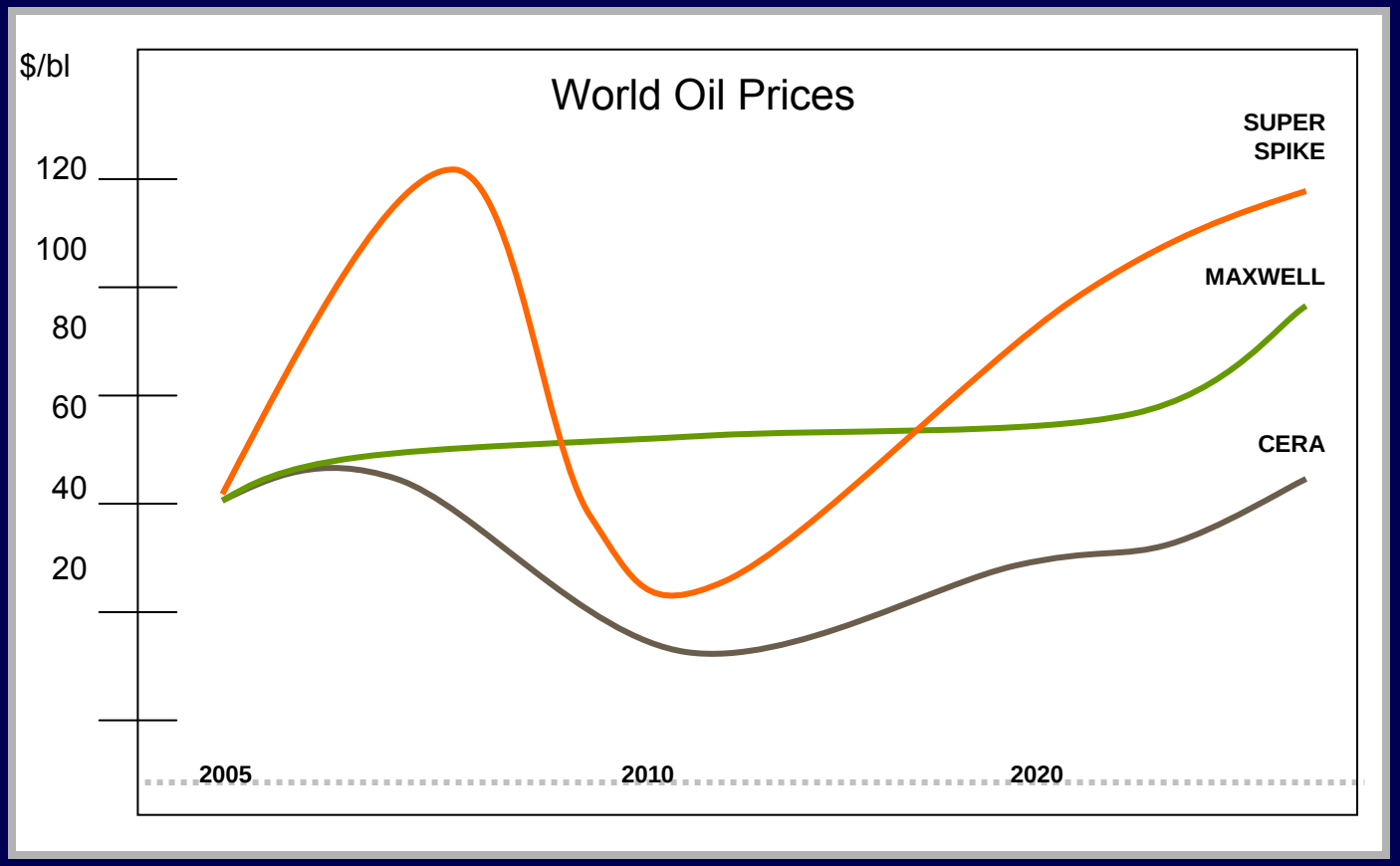
- **Theory says yes.** Long-run changes in prices would push drivers to fundamentally alter their behavior.
  - Buy more fuel efficient cars
  - Move closer to work/school
- Older studies say long run elasticity = -0.5 to -0.7
- But
  - If short run elasticities have dropped, then long run elasticities probably have dropped also, and …
  - After several years of high prices, we would expect some long run behavior to already be occurring, but not much evidence it is (gasoline sales still strong)

Long Run Elasticity May Be Very Small?

- Drivers may never exhibit “long run” behavior?
  - Gasoline prices unlikely to increase on sustained basis much beyond where they are today
  - Gasoline prices cyclical, meaning drivers always expecting prices to drop

World Oil Price Scenarios

Three “theories”



Long Run Elasticities

- Long run elasticity may be as little as -0.2?!

***Exception**: long run elasticity would be greater if govt imposed large graduated fuel tax (creating certainty of higher fuel prices)*

Policy Implications

- Gasoline and carbon taxes need to be very high (and permanent) to significantly reduce fuel consumption and carbon emissions.
  - Also means “cap and trade” would not be very effective for transportation (where the cap is placed on oil refineries)
- But there are other reasons to impose fuel/carbon taxes and carbon caps on refineries …
    - **Makes it easier to introduce alternative fuels**
    - **If permanent, might induce long term changes in behavior**
    - **Generate large revenue stream (compensate low income HHs, fund R&D, etc)**
- Other regulatory and policy instruments seem more effective at reducing oil use, GHGs, and VMT
    - **Vehicle standards (for fuel economy and GHGs)**
    - **Low carbon fuel standards**
    - **Feebates**

Conclusions

- **“Cap and trade” and carbon and fuel taxes will have little effect into the foreseeable future**
- **But, they are still worth implementing because they …**
  - **Send clear market signal that carbon is bad**
  - **Generate revenue that can be used for carbon and oil reduction (for low income HHs, R&D, and temporary payoffs to disadvantaged companies)**

➢ ***Many more grad students and researchers needed at UC Davis (and elsewhere) to study these policies and strategies***