Evaluating Vehicle Technologies – Electronic Stability Control

USING AUSTRALIAN USED CAR SAFETY RATINGS DATA

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What is UCSR

- Police reported crash data from 5 Australian states + New Zealand
- Data for crashes from 2001-2008 (for this study)
- 1,984,523 vehicles
- Includes VINs for crashed vehicles
Project Aims

• Evaluate the effectiveness of ESC in preventing crashes in NZ and Australia
• Validate results of 2008 study
• Estimate effectiveness for
  – Specific types of crashes
  – Serious injury crashes
ESC by year of crash
ESC by year of manufacture
Data

• 2001-2008 crash data (3 extra years)
• Sample of data available for analysis:
  – 2007: 221,595 (7,699 with ESC)
  – 2010: 466,795 (27,252 with ESC)
• Range of ESC-fitted vehicles
  – 2007: 90 different models
  – 2010: 175 different models
Methodology

• Rear end impacts used to Induce exposure
• Poisson Regression
• Improved matching of treated vehicles to control groups
  – 2070: 16 treatment-control pairs
  – 2010: 64 treatment-control pairs
• Controlling for confounders
Results

- A Broader range of results reported
  - Vehicle Type:
    - Cars, 4WDs & Commercials
  - Crash Type:
    - MVA + head on + side impact
    - SVA + rollover
    - Road surface (Wet / dry)
    - Crash location (Metro / Rural)
  - Crash Severity:
    - All (including PDO), driver injury & Serious Crashes
Overall Effectiveness

![Graph showing adjusted effectiveness for different crash severities and vehicle types.](image)
Single Vehicle Crashes

![Graph showing adjusted effectiveness for different crash severities and vehicle types.](Image)
Rollover Crashes

The image shows a bar chart titled "Rollover Crashes". The chart compares the adjusted effectiveness of rollover crashes across different severity levels: all crashes, driver injury crashes, and serious injury crashes. The categories are further divided into different vehicle types: all vehicles, cars, 4WDs, and commercials. The chart uses bars to represent the percentage adjusted effectiveness, with error bars indicating variability.
Multiple Vehicle Crashes

Bar chart showing adjusted effectiveness (%) for different crash severities and vehicle types. The chart compares all vehicles, cars, 4WDs, and commercials. Categories include all crashes, driver injury crashes, and serious injury crashes.
Head On Crashes

The chart illustrates the adjusted effectiveness of different types of vehicles in head-on crashes, categorized by crash severity and vehicle type. The x-axis represents crash severity, ranging from all crashes to serious injury crashes. The y-axis shows the adjusted effectiveness percentage. The chart includes data for all vehicles, cars, 4WDs, and commercials, with error bars indicating variability in the data. The chart shows that 4WDs have a higher adjusted effectiveness in all crashes compared to other vehicle types, with cars and commercials having significantly lower effectiveness.
Crashes in Rural Areas

![Graph showing adjusted effectiveness of crashes in rural areas by vehicle type and crash severity.]

- **All crashes**
- **Driver Injury Crashes**
- **Serious Injury Crashes**

Vehicle Types:
- All vehicles
- Cars
- 4WDs
- Commercials
Discussion

• Controlling for confounding factors
  – Secondary Safety
  – Driver characteristics
• Single Vehicle Crashes:
  – Effectiveness for serious injury crashes lower than for all injury crashes – why?
• Risk Compensation effect?