Economic Modeling of Tobacco Control Policy Effects on Low SES and Minority Racial/Ethnic Groups

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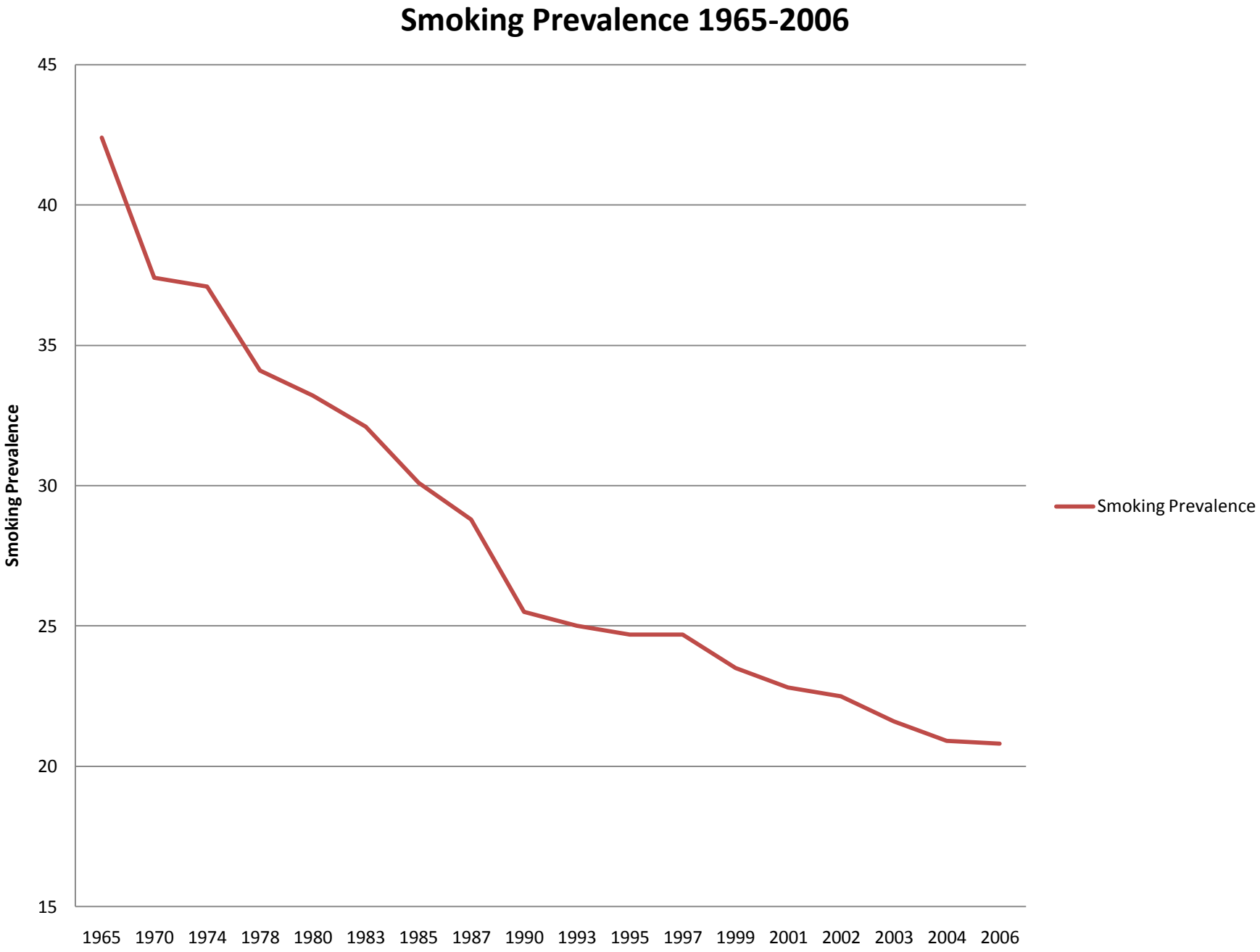
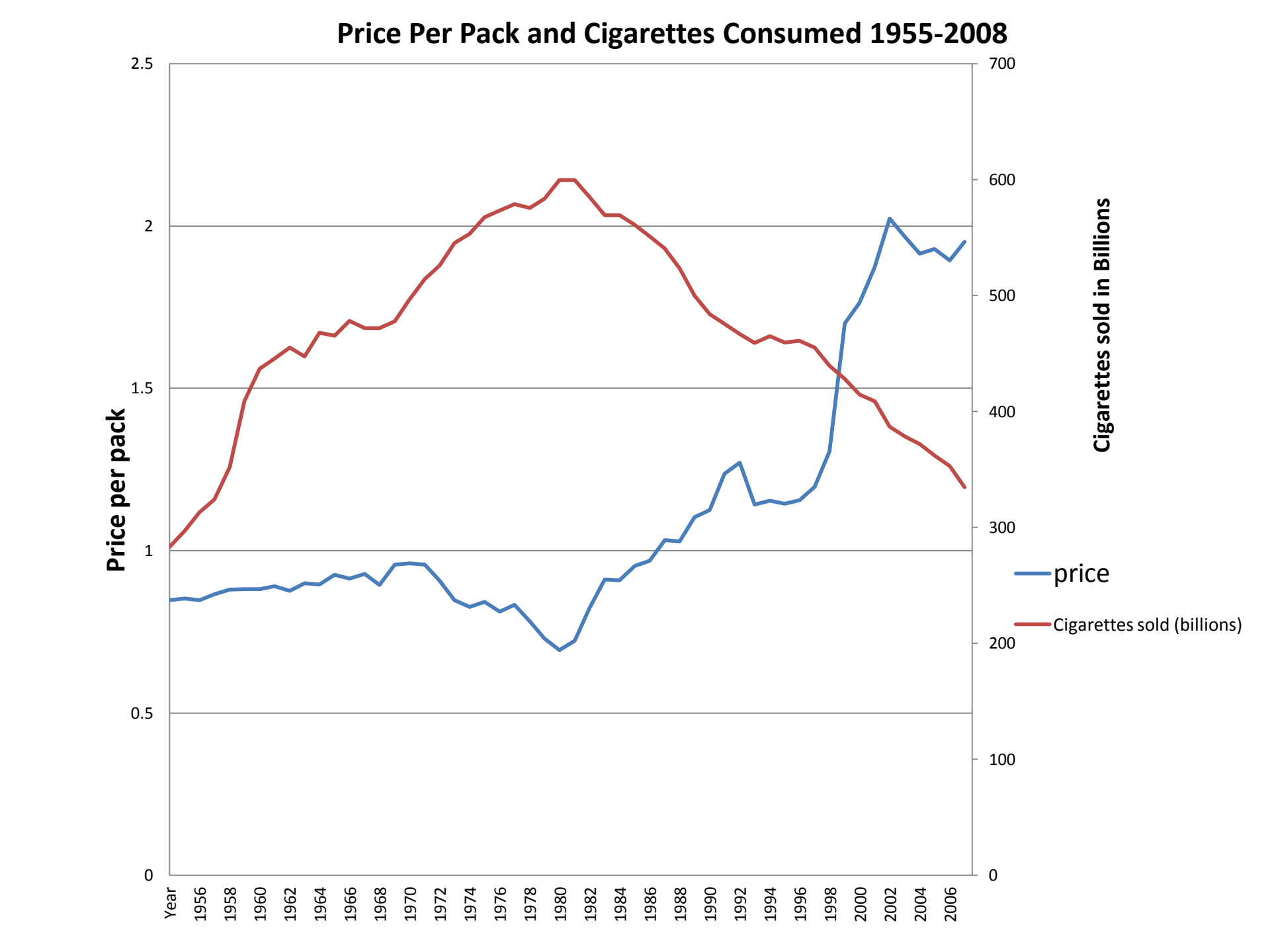
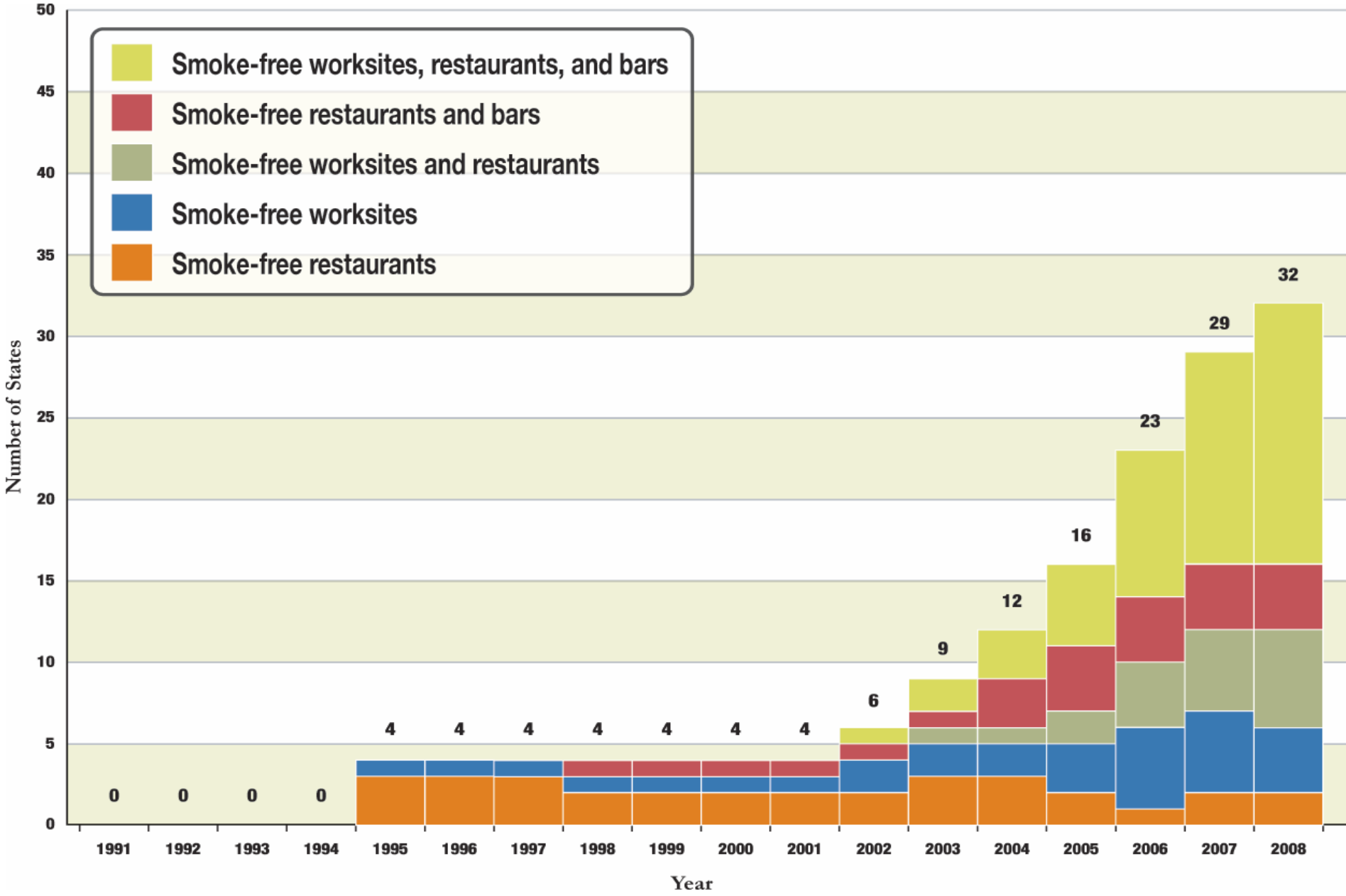
Government Campaign to Reduce Tobacco Use

- Elements of Campaign:
  - Information Dissemination
  - Advertising Bans
  - Anti-Smoking Advertising
  - Youth Access
  - Clean Indoor Air Laws
  - Excise Taxes


Smoking Prevalence 1965-2006
Smoking Prevalence
45
40
35
30
25
20
15
1965
1970
1974
1978
1980
1983
1985
1987
1990
1993
1995
1997
1999
2001
2002
2003
2004
2006
Smoking Prevalence


Price Per Pack and Cigarettes Consumed 1955-2008
Price per pack
Cigarettes sold in Billions
2.5
2
1.5
1
0.5
0
700
600
500
400
300
200
100
0
Year
1956
1958
1960
1962
1964
1966
1968
1970
1972
1974
1976
1978
1980
1982
1984
1986
1988
1990
1992
1994
1996
1998
2000
2002
2004
2006
price
Cigarettes sold (billions)



Note: Reflects policies in effect through September 30, 2008.
Source: Giovino et al, 2009.

Two TReND Projects

1. Examines the effect of state-level smoke-free air laws and cigarette prices on cigarette smoking prevalence and intensity among race and ethnic groups in the United States.

2. Examines the effect of state-level smoke-free air laws, cigarette prices, and state spending on tobacco control on smoking cessation decisions among Low SES and High SES youth and young adults.

Project 1: Data

- September 1992- November 2003 CPS-TUS
  - CPS is a monthly survey of approximately 50,000 households. Representing the civilian non-institutional population
- Sample (self responding adults Aged 18+)
  - All races/ethnicities combined 891,672
    - Whites 714,097
    - Blacks 76,508
    - Asian/PI 25,341
    - AI/AN 9,522
    - Hispanic 66,204

Dependent Variables

Cigarette Smoking

1. Indicator for smoking in the past 30 days

2. Average monthly cigarette consumption for smokers

Data

Wide variety of socioeconomic and demographic information

- Race/ethnicity
- Gender
- Age
- Age Squared
- Education
- Employment Status
- Marital status
- Family income
- Family income squared
- State fixed effects
- Time fixed effects

Tobacco Policies

- Cigarette Prices
  - Tobacco Institute
  - State-level quarterly weighted average price per pack of 20 cigarettes
  - Deflated by the Consumer Price Index (1982-1984=100)
- Smoke Free Air Laws
  - ImpacTeen: Private Worksites, Restaurants, and Bars
  - Mutually Exclusive but all inclusive indicators
    - Complete Ban
    - Law less restrictive than smoking ban
    - No smoking restriction – benchmark
  - Smoke-Free Air Index
    - Smoking completely banned, restriction rating=2
    - Law Less restrictive than ban, restriction rating=1
    - No smoking restriction, restriction rating=0
    - Index derived by adding up the equally weighted restriction ratings for each of the venues

Estimation

- Two Part Model:
  - Probit method for smoking prevalence
  - GLM with log-link and Gaussian distribution for conditional cigarette demand

- Cigarette Demand Equations estimated for:
  - All races/ethnicities combined
  - Separate Race/ethnicity equations

Price Results

- All races/ethnicities combined
  - Negative and Significant Impact in all equations
    - Prevalence price elasticity = -0.1164
    - Average smoking price elasticity = -0.068

- Race/ethnicity specific equations
  - Blacks and Whites are driving the negative and sig price effects
    - Prevalence
      - Black Prevalence Price Elasticity = -0.193
      - White Prevalence Price Elasticity = -0.147
    - Average Smoking
      - White are only race ethnicity where price has negative and sig. effect

Smoke-free air results Whites

- Relatively severe multicollinearity when SFA indicators for all venues are included simultaneously.
- Each venue added separately
  - Worksite and restaurant bans and restrictions and bar restrictions are found to have a neg. and sig. impact on smoking prevalence
  - Restaurant bans and restrictions and worksite restrictions are found to have a neg. and sig. impact on average smoking
- Smoke-free air index
  - Found to have a negative and significant effect on smoking prevalence and average smoking

Smoke-free air results other races

- Worksite smoking bans have a negative and significant impact on Black smoking prevalence
- Bar smoking restrictions have a negative and significant impact on average smoking by Asian/PI
- Worksite and Restaurant smoking restrictions have a negative and significant impact on American Indian/AN smoking prevalence
- Worksite and Restaurant smoking restrictions have a negative and significant impact on average smoking by Hispanic smokers

Project 2: Data

- NLSY97 First 10 waves (1997-2006)
  - Nationally representative sample of 9,022 youths aged 12–16 as of December 31, 1996.
  - follow-ups on each individual conducted on an annual basis.
  - age range of this panel (12–28)
    - covers the ages at which most individuals establish their smoking habits, with many making quit attempts and successfully quitting

Dependent Variable

- Smoking Cessation
  - Indicator variable
    - equal to 1 if individual is a smoker in the current wave of data, but is a non-smoker in the immediate next wave of data.
    - equal to 0 if individual is a smoker in the current wave of data and continues to smoke in the immediate next wave of data.
    - A threshold of 3 or more days smoking in the past month in the current wave is used to define a current smoker.

Data

Wide variety of socioeconomic and demographic information

- Race
- Ethnicity
- Gender
- Age
- Education (HGC)
- Employment Status
- Marital status
- Income
- Enrollment in HS ,Col
- State fixed effects
- Time fixed effects
- Month fixed effects

Tobacco Policies

- Cigarette Prices
  - Tobacco Institute
  - State-level quarterly weighted average price per pack of 20 cigarettes
  - Deflated by the Consumer Price Index (1982-1984=100)
- Smoke Free Air Laws
  - Smoke-Free Air Index (defined the same as previous project)
- Monthly inflation adjusted state-level per capita expenditures on tobacco control
  - excise tax, MSA, and general revenue earmarked for tobacco control programs
  - Americans' Stop Smoking Intervention Study program (ASSIST)
  - Initiatives to Mobilize for the Prevention and Control of Tobacco Use (IMPACT)
  - National Tobacco Control Program
  - RWJF SmokeLess States
  - American Legacy Foundation

Estimation

- Discrete-Time Hazard Model:
  - Logit methods
  - Standard errors cluster corrected at state level

- Cessation Equations estimated for:
  - All Individuals combined
  - Low SES and High SES Separately
    - Residential Parents Education is Proxy for SES
      - Low SES=No parent has a college degree
      - High SES=At least one parent has 4 or more years of college

Results

- Price
  - The real price of cigarettes has a positive and significant effect on youth and young adult smoking cessation
    - Low SES are particularly responsive to price
    - high SES price results are not significantly different from zero

- Real Per-Capita Tobacco Control Funding
  - Real per-capita TC funding has a positive and significant effect on youth and young adult smoking cessation
    - Low SES are particularly responsive to funding
    - high SES price results are not significantly different from zero

Magnitude of Results

Table 1
Elasticities and Predicted Cessation Rates

	Price Elasticity of Cessation	**Simulations, Price set at:**		
		Minimum=$0.92	Mean=$1.844	Maximum=$3.132
Full Sample	0.618	10.54	14.49	20.22
Parents Less than College Education	0.830	9.2	14.05	21.76

Table 2
Elasticities and Predicted Cessation Rates

	TC funding Elasticity of Cessation	**Simulations, Per Capita Funding set at:**		
		Minimum=$0	Mean=$0.0945	Maximum=$0.8289
Full Sample	0.089	10.54	14.49	20.22
Parents Less than College Education	0.1388	9.2	14.05	21.76

Conclusions

- Higher cigarette prices are found to significantly:
  1. Reduce overall smoking prevalence and average smoking
     - Blacks and Whites are driving the significant results
  2. Increase smoking cessation rates by youths and young adults
     - Low SES are driving the significant results

- Higher spending on tobacco control per capita increases the probability of cessation youth and young adults
  - Low SES are driving the significant results

- Stronger SFA laws have strong effect on WHITE smoking. Specific SFA laws impact other racial and ethnic groups