

ASSOCIATION BETWEEN ALCOHOL PRICES AND ALCOHOL-RELATED TRAFFIC ACCIDENTS IN ESTONIA

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Alcohol-related traffic accidents in Estonia



Source: Estonian Road Administration

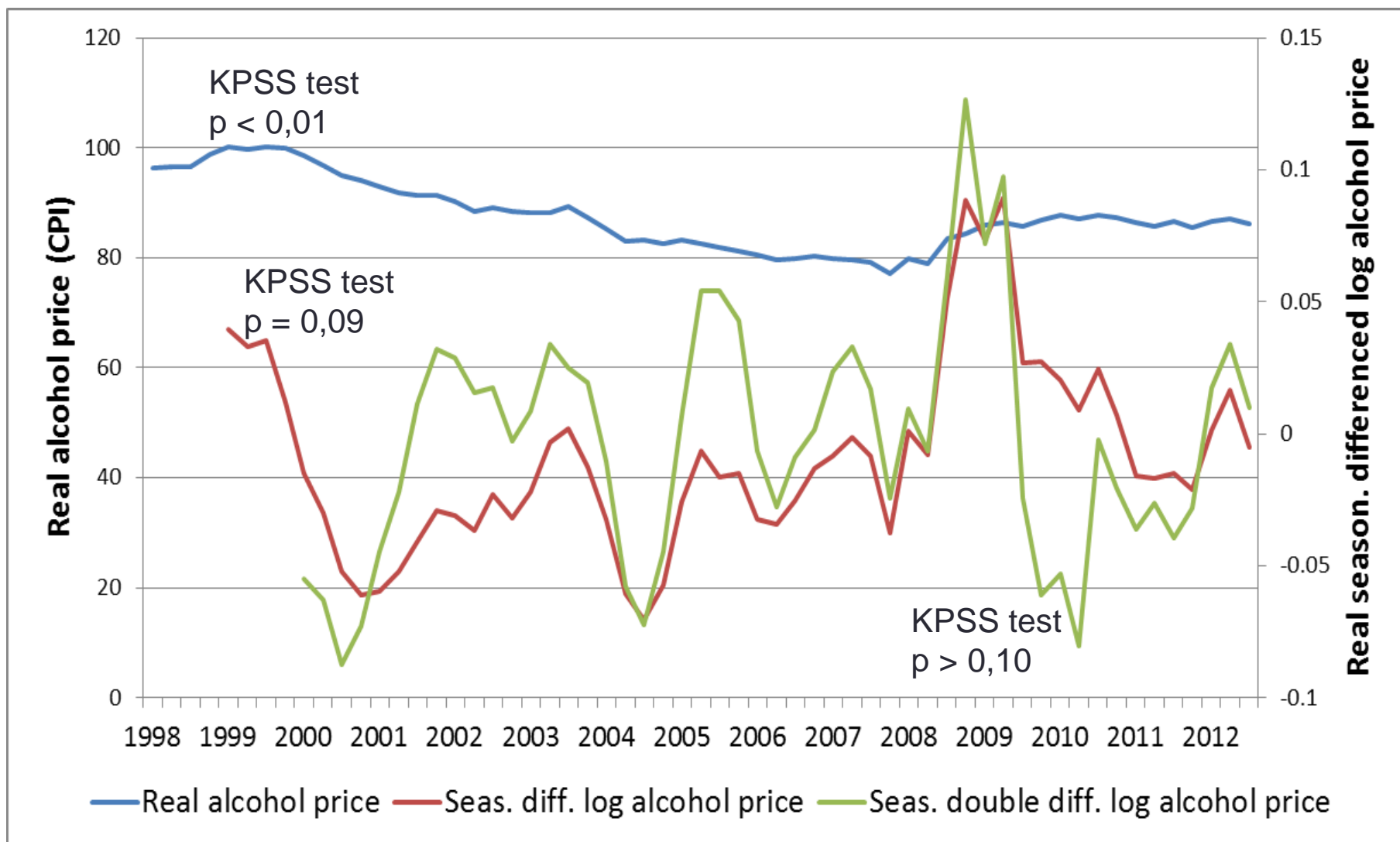
Tax policy effects?

- Estonia`s alcohol-related policy:
 - (a) raised tax rates on alcohol by approximately 70% during 2005-2012 (from 2012 onwards by 5% every year)
 - (b) imposed alcohol sale restrictions from 2008 onwards (sale prohibited from 10 a.m. to 10 p.m.)
 - (c) installation of speed cameras in 2009 on rural highways
 - (d) several campaigns and the police activities
- **What effect has the price policy had on traffic?**

Methodological approach

- Quarterly data for 1998-2012:
 - (a) accidents, injuries and fatalities involving drunken motor-vehicle driver (Estonian Road Administration)
 - (b) price index of alcoholic beverages (Statistics Estonia), converted to real prices
- Log-log regression models with ARIMA errors
- Maximum likelihood (ML), conditional sum of squares (CSS) and CSS-ML parameter estimates were obtained in R and Gretl
- Identification of ARIMA process: KPSS unit root test, autocorrelation plot, Akaike criterion

Data analysis



Results: Seasonal ARIMA(0,0,1)(1,1,0)

	Accident	Injury	Fatality
SDL(alc_price)	-4,13***	-4,88***	-5,61***
Seasonal AR	-0,31**	-0,32**	-0,45***
MA	0,31***	0,26**	0,12
Ljung-Box test (lags=10)	p=0,30	p=0,33	p=0,09

***p < 0,01 **p > 0,05 *p < 0,1

Results: Seasonal ARIMA(0,0,0)(1,2,0)

	Accident	Injury	Fatality
SD ² L(alc_price)	-4,96***	-5,74***	-8,24***
Seasonal AR	-0,66***	-0,66**	-0,77***
Ljung-Box test (lags=10)	p=0,08	p=0,22	p=0,00

***p < 0,01 **p < 0,05 *p < 0,1

Conclusions

- Price policy in Estonia seems to have played an important role in curbing traffic-related harm
- 1% increase in the real average price is associated with 4-6% decrease in alcohol-related accidents, injuries and fatalities
- The robustness of the results will be checked in the future analysis