

ECON6300/7320/8300
Advanced Microeconomics
Instrumental variables

Assignment Project Exam Help

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Practical 4
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Introduction

- ▶ This class will review:
 - ▶ Instrumental variables
 - ▶ 2SLS and GMM estimation
 - ▶ Tests for endogeneity of regressors
 - ▶ Tests for weak instruments
 - ▶ Tests of overidentifying restrictions (instrument validity)
- ▶ We begin with a demonstration from Microeconometrics using STATA Chapter 6 looking at the effect of employer/union sponsored health insurance on drug expenditures
- ▶ We move on to a practical looking at the the returns to schooling

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Demonstration (1)

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- ▶ We analyse data on health, retirement and private insurance
 - ▶ The data is from the Medical Expenditure Panel Survey
 - ▶ We explore the effect of employer/union sponsored health insurance (`hi_empunion`) on (log) drug expenditure (`ldrugexp`)
 - ▶ We treat insurance as endogenous as it is a choice variable. Those who expect high future medical expenses are more likely to take out insurance.

Demonstration (2)

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- ▶ We analyse data on health, retirement and private insurance
- ▶ We consider as instruments:
 - ▶ The proportion of total income that comes from social security (*ssratio*)
 - ▶ An indicator for low income status (*lowincome*)
 - ▶ The size of the individual's firm's labour force (*firmsz*)
 - ▶ Whether the firm operates in more than one location (*multlc*)
- ▶ As exogenous regressors we include number of chronic conditions (*totchr*), age, female, black/hispanic indicator (*blhisp*) and log income (*linc*)
- ▶ The data are *mus06data.dta* and the do file is *mus06p1iv.do*

Practical (1)

- ▶ We use data from Kling (2001) : mus06klingdata.dta are wage data collected in 1976
- ▶ We want to estimate the impact of years of schooling (grade76) on wages (wage76)
- ▶ Other covariates in the wage equation could be black, south76, smsa76, reg2-reg9, smsa66, age76, agesq76. (Use desc)
- ▶ Years of schooling (grade76) is endogenous! Those with higher ability tend to have more schooling, and ability ought also to determine wages.
- ▶ Possible instruments could be proximity to a 4 year college (col4) or family education levels (e.g. dadeduc, momeduc)

Practical (2)

- ▶ Load the data
- ▶ Describe, summarise and choose a baseline instrument(s)
- ▶ Estimate the 2SLS model and optimal two-step GMM. Assume heteroskedastic errors. Interpret your results
- ▶ Compare your results with the OLS estimator.
- ▶ Are your results sensitive to the choice of instrument(s)?
- ▶ Is there evidence of endogeneity of the regressors in your wage equation?
- ▶ Are your instruments weak?
- ▶ Are your instruments valid?

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