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Does understanding physician markets require modelling both supply and demand? Evidence from Australian GPs

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and**

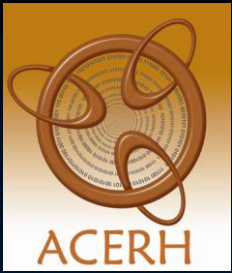
Australian Primary Health Care Research Institute

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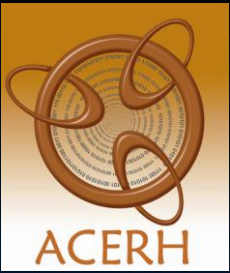
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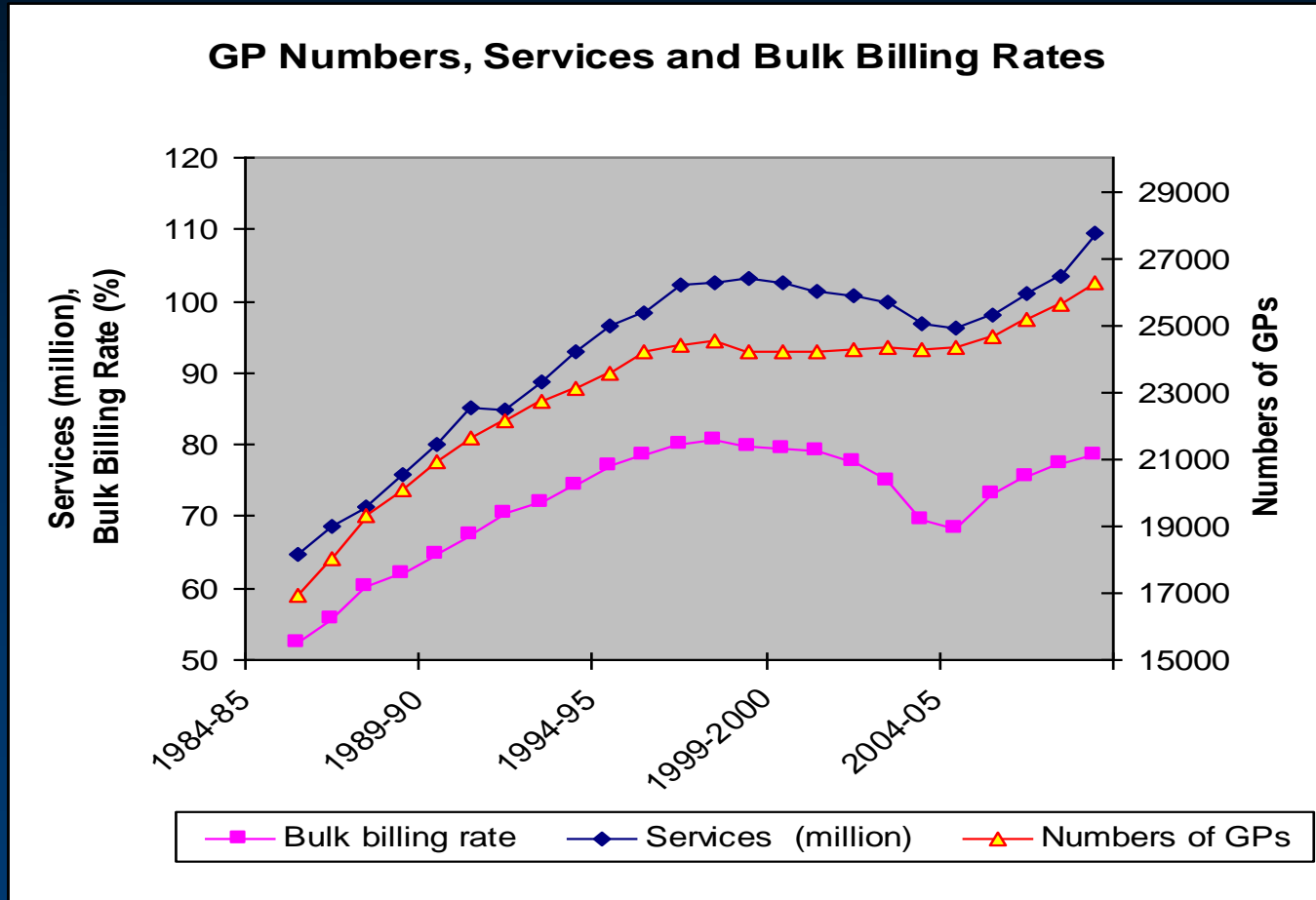


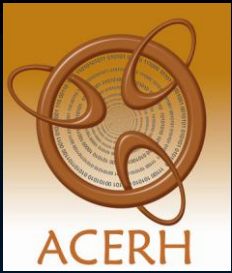
The Australian System

- **Universal public insurance for medical services (Medicare)**
- **A government “rebate” is available for every medical service**
 - **Doctors may bill at any level they wish**
 - **May bill above the rebate - patients make “gap” payments**
 - **It is not permitted to insure “gap” payments for out of hospital services**
 - **Around 70% of GP services are “bulk billed”,**
 - **i.e. provided at the rebate level with zero patient “gap”.**

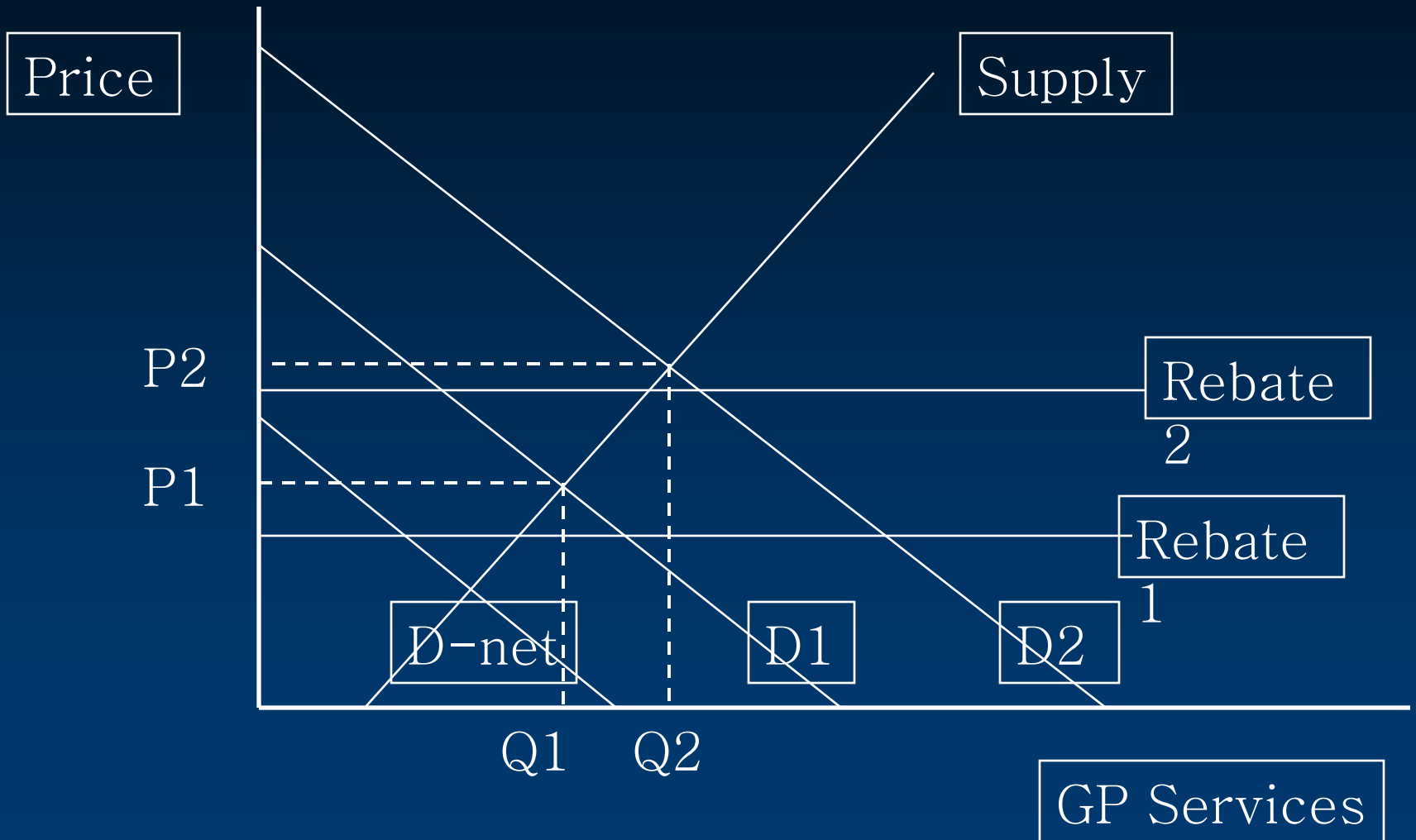


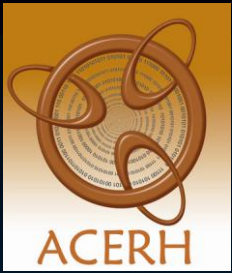
GP number, GP services and bulk billing, 1984-85 to 2007-08





GP supply and demand in Australia

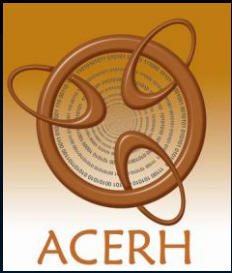




Data

Annual observations for 816 areas based on Statistical Local Areas (SLAs)

- **Eight years 1996 to 2003.**
- **Core data from Medicare Australia**
- **Merged with Census data**
- **Range of ad hoc sources (eg hospital, nursing home, private schools)**
- **A pooled cross-section time series dataset**



The Model

$$Demand = \alpha + \beta * NetFee + \gamma * GPdensity + \delta * Health + f_1 + \varepsilon_1 \quad (1)$$

$$GPdensity = \phi + \varphi * GrossFee + f_2 + \varepsilon_2 \quad (2)$$

$$Health = \eta + \lambda * Services + f_3 + \varepsilon_3 \quad (3)$$

$$ServicesperGP = \mu + \nu * GrossFee + f_4 + \varepsilon_4 \quad (4)$$

$$Supply = GPdensity * ServicesperGP \quad (5)$$

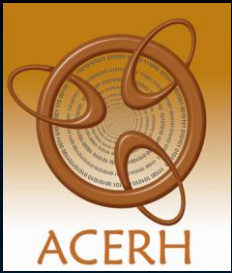
$$NetFee = GrossFee - AverageRebate \quad (6)$$

$$Supply = Demand = Services \quad (7)$$

f_i indicates a set of exogenous variables

ε_i indicates error terms

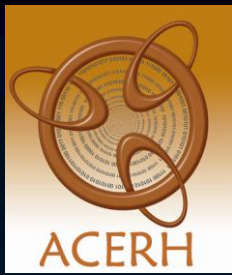
Equations (5) - (7) are identities



Modelling

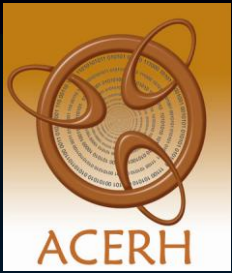
Equations modelled separately

- Population weighted linear models
- GMM methods (2SLS) with fixed effects panel modelling
- Equations tested for
 - Identification/instrument strength and validity/spatial correlation/overfitting
- Problems of identification, border crossing and omitted variables addressed:
 - panel, explicit border crossing measures, many variables and careful testing



Linear panel model of demand

- Model is similar to many others
- Price elasticity of demand is -0.19 ($t=8.4$)
- Elasticity of GP density is 0.13 ($t=4.7$)
 - at lower end of range in literature
 - effect on outcomes is small



Supply Equation

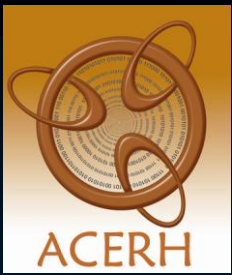
$$\text{Supply} = \text{GPs per capita} * \text{services offered per GP}$$

The two components are expressed as functions of price at the mean values of all exogenous variables.

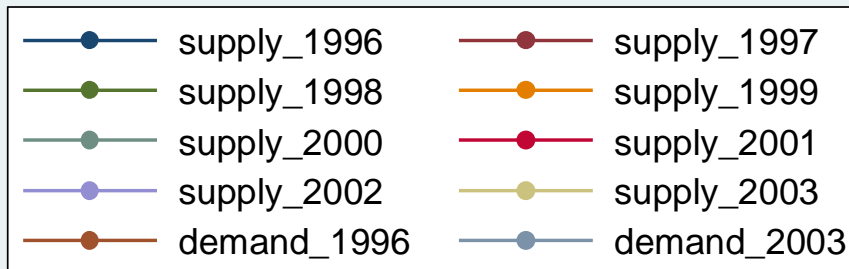
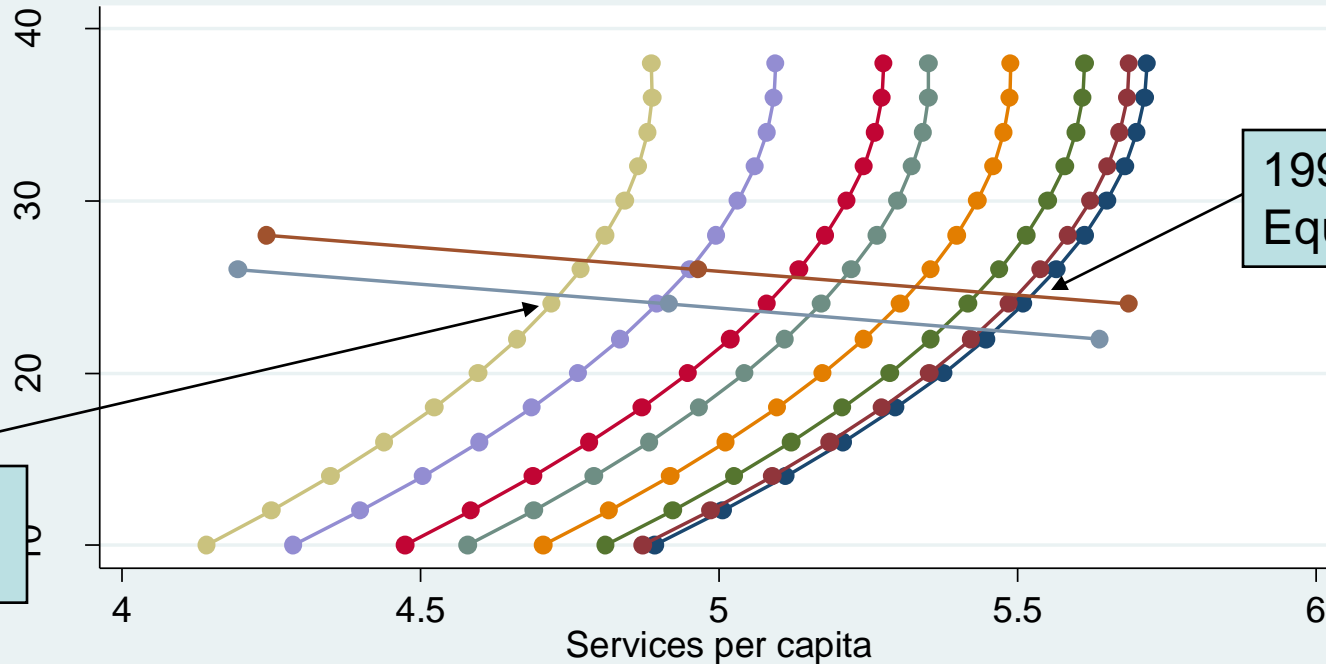
The overall Supply Equation is then the product of the two components

$$\text{Supply} = 3.096 + 0.079 * \text{Gross Fee} - 0.001 * (\text{Gross Fee})^2$$

(At the mean values across the eight years)

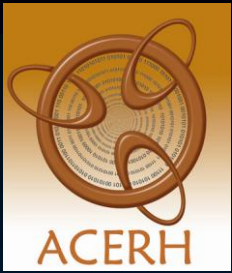


Annual supply curves with 1996 and 2003 demand curves



2003
Equilibrium

1996
Equilibrium



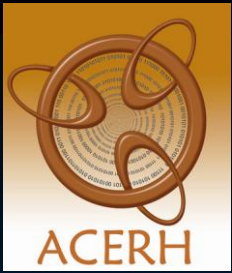
Main determinants of supply and demand

Demand

- the real value of the rebate
 - will decline under current indexation arrangements
- Health and socio-economic determinants as expected

Supply:

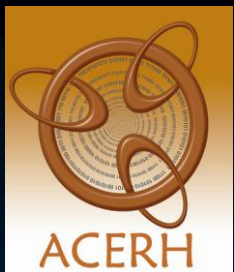
- National number of GPs
- GP demography – feminisation and aging
- Attitudes to work



Implications

The GP market outcomes depend on shifts in both supply and demand

- **When the government increased rebates in 2004-05 demand shifted right considerably**
- **Government policies have also shifted supply to the right**
- **The Global Financial Crisis will slow retirements and will shift the supply to the right**
- **It will also increase unemployment and shift demand right**



Thank you