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***Information, Supplier-Induced  
Demand and Provider  
Responses to Incentives***

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# *Lecture 7: Information, SID and provider responses to incentives*

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This lecture should enable you to:

- Identify agency relationships in the health sector and how they 'solve' the problem of imperfect and asymmetric information
- Critically assess the potential for supplier-induced demand (SID) and its implications for the operation of health care markets
- Analyse how suppliers may be expected to respond to financial and other incentives in the context of imperfect agency

# *Revision – markets & information*

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## ■ Lecture 5:

- Perfectly competitive market provides optimal outcome
- Requires “perfectly informed consumers” (know (quality of) all products, all prices, own preferences)

## ■ Lecture 1:

- Patients are not “perfectly informed”
- Doctors are “better informed”
- Leads to *information asymmetry* (one party to transaction has more information than other)
- Cause of market ‘failure’ in health care

# *Information imperfection and asymmetry*

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- Imperfect information on supply side leads to adverse selection – see lecture 6
- Imperfect information on *demand* side leads to consumer moral hazard (lecture 6) and producer moral hazard (this lecture)
- Demand-side uncertainty includes:
  - Diagnosis, prognosis, available interventions, effectiveness/side-effects of interventions, costs of interventions, translating ‘effectiveness’ into ‘utility’
- Supplier *better* informed about many of these (although the last is debatable!)

# Agency

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- Imperfect information makes information costly
- The market 'solution' to imperfect information is the *agency relationship*
- 'Principal' (patient) appoints 'agent' (health provider) to advise them in making decision
  - Principal combines information with preferences to make decision *as if they were perfectly informed*
  - More usually agent combines information with principal's (expressed) preferences to make decision (doctors make decisions *for* patients)
- Agent is usually supplier, creating situation where one actor is simultaneously *both* demander and supplier in the market

# Agency is ...

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“The **doctor** is there to give the **patient** all the information that the **patient** needs in order that the **patient** can make a decision, and the **doctor** should then implement that decision once the patient has made it”

**OR IS IT ...**

“The **patient** is there to give the **doctor** all the information that the **doctor** needs in order that the **doctor** can make a decision, and the **patient** should then implement that decision once the **doctor** has made it”

# Perfect agency

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- The agent (health professional) combines their knowledge with the principal's (patient's) expressed preferences to determine a choice that the principal (patient) would have chosen had they been thus informed!
- Problems facing the agent:
  - What should the agent seek to maximise? Patient health status or utility? Societal health or utility?
  - How can they determine patient preferences? What about when patient incapable of communicating etc?
  - What about the health professionals role as 'agent' of their health system (public or private)? Double agent!!

# *Imperfect agency*

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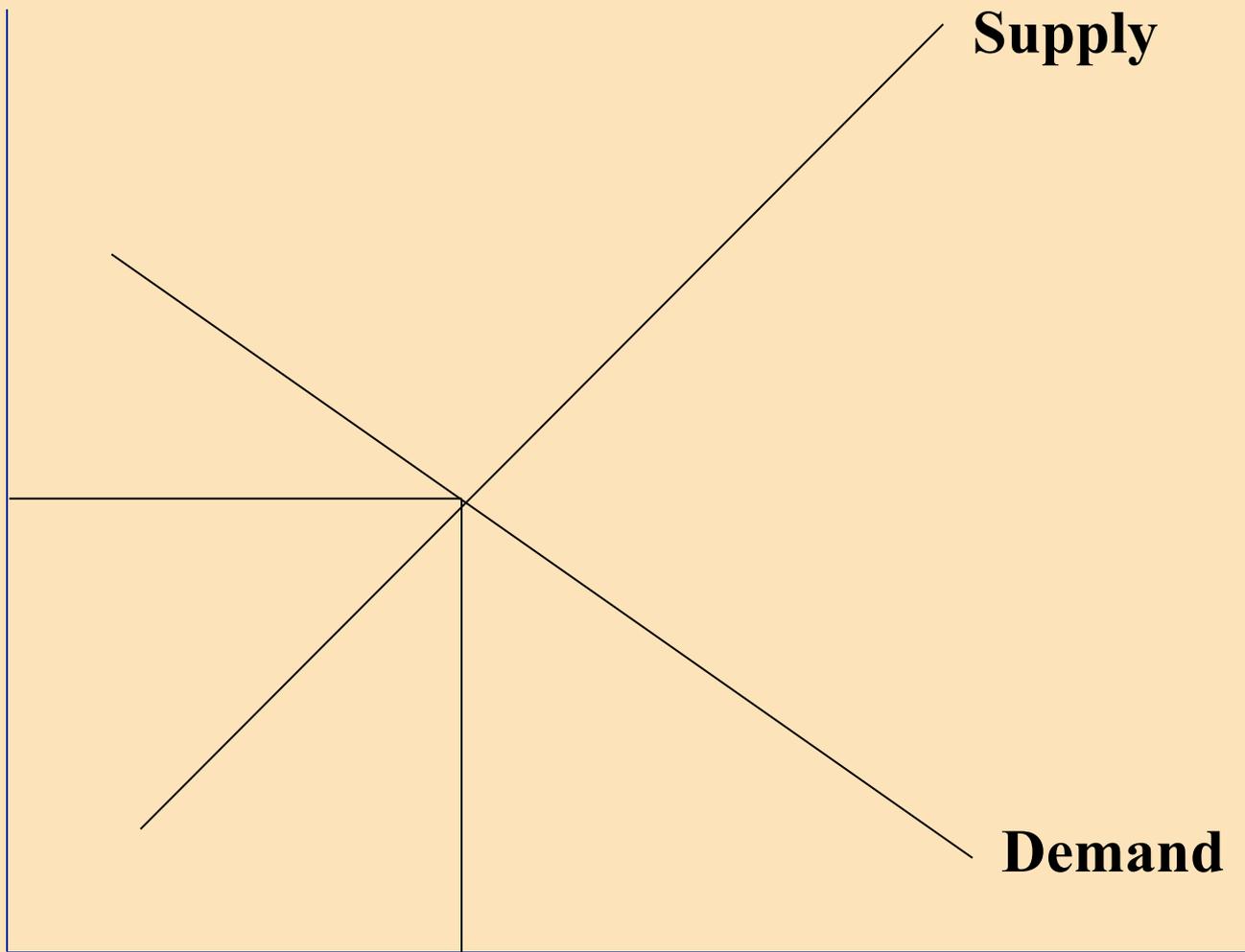
- In practice, health providers (like other human beings!) are not perfect at putting the interests of others before their own interests
- Information asymmetry and the agency role gives rise to the possibility of *demand inducement* by the supplier of health care
- Generates need for:
  - ethical code/ professional self-regulation
  - effective monitoring/ policing of provider behaviour
  - *incentives* to influence provider behaviour (provider-payment mechanisms) – see later

# *Supplier induced demand (SID)*

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- “Demand in excess of what would be chosen if patient had available the same information and knowledge as the doctor”
  - Not restricted to health care – e.g car mechanics, house builders, wine waiters, module organisers...
- First observed for hospitals – “A bed built is a bed filled” (‘Roemer’s Law’, 1961)
- More generally, observation that when faced with shock to equilibrium (eg increase supply), health providers *may* respond by ‘inducing demand’ (shift demand curve) for their services

**Price**



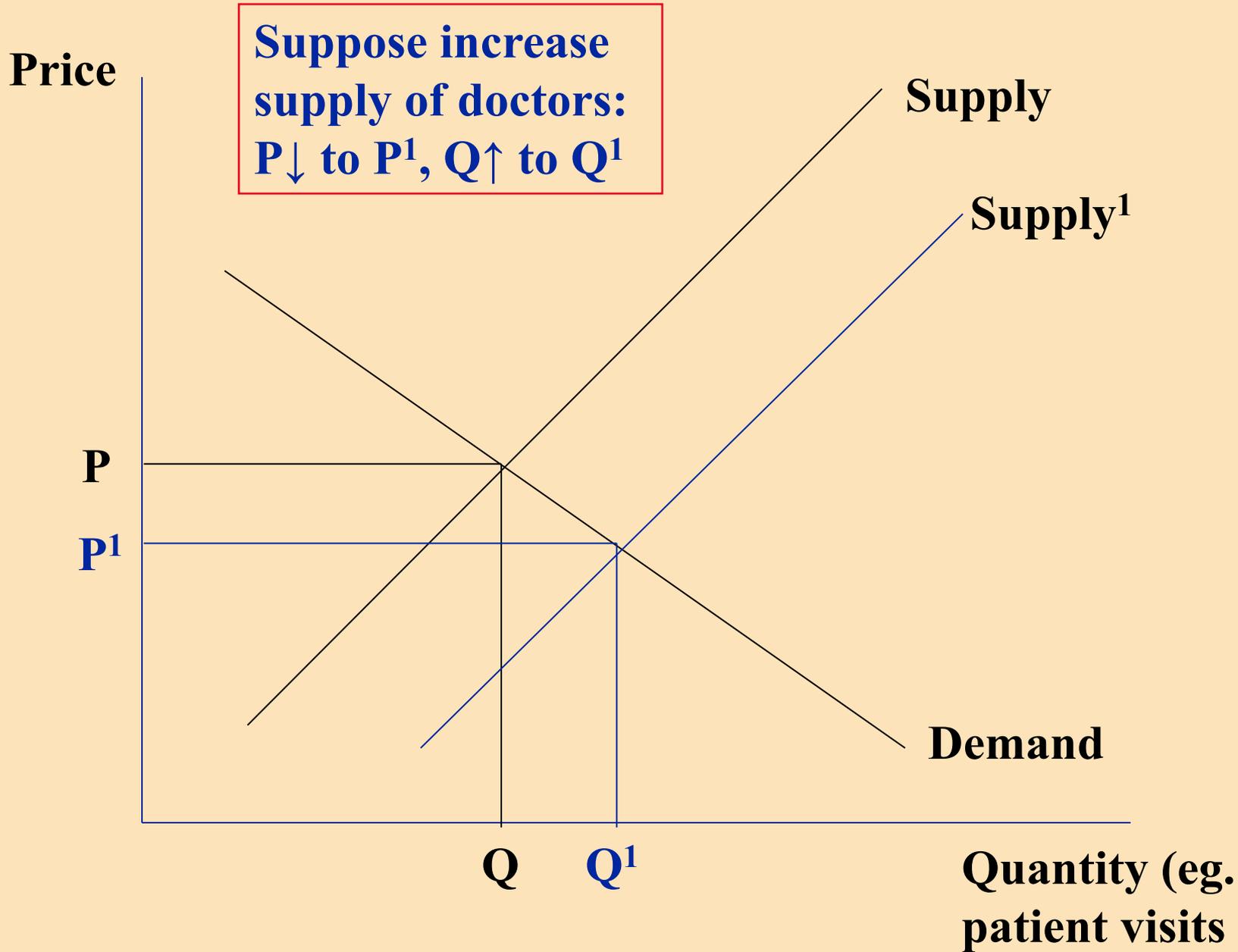
**Supply**

**P**

**Demand**

**Q**

**Quantity (eg.  
patient visits)**



Suppose increase  
supply of doctors:  
 $P \downarrow$  to  $P^1$ ,  $Q \uparrow$  to  $Q^1$

Price

Supply

Supply<sup>1</sup>

$P$

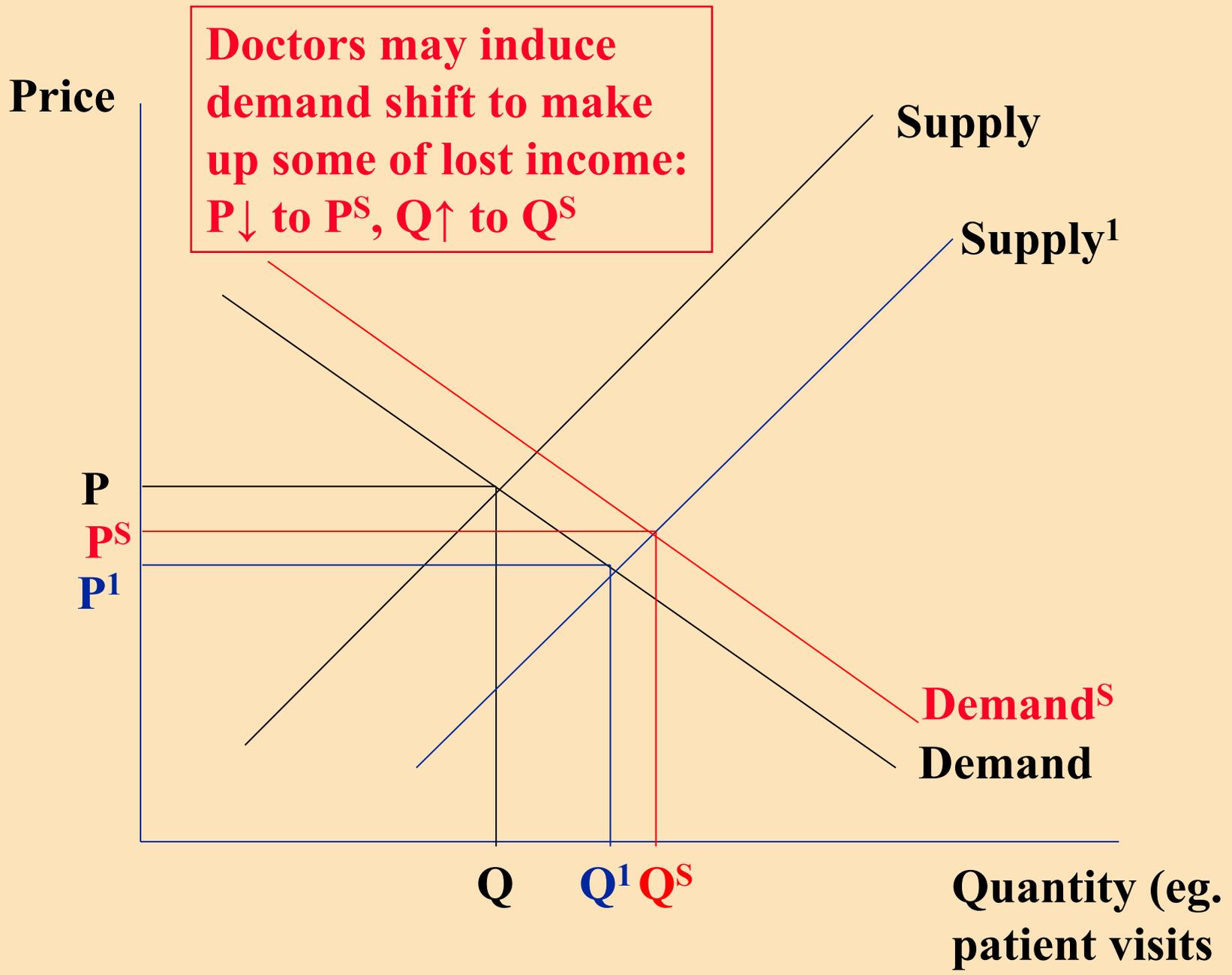
$P^1$

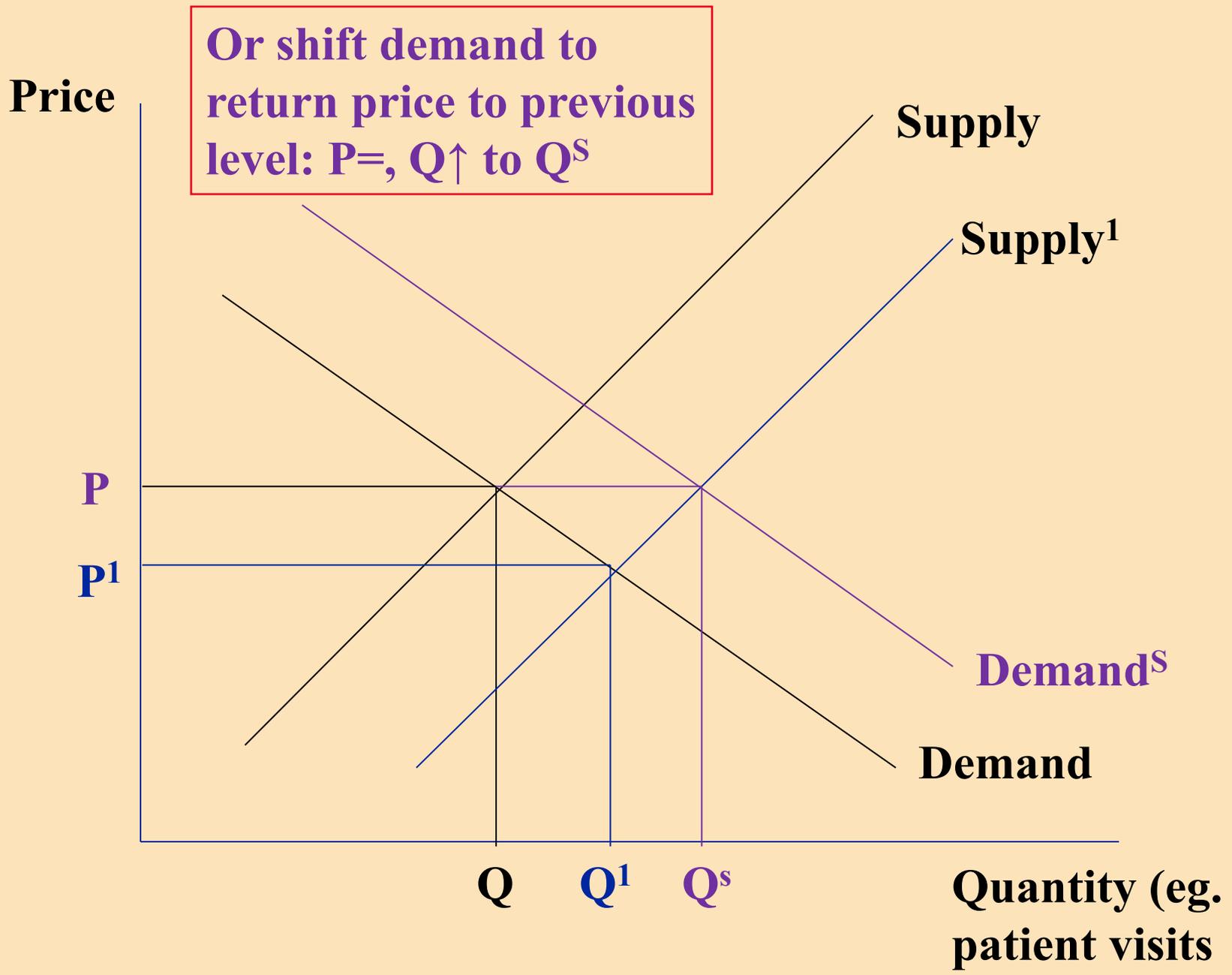
Demand

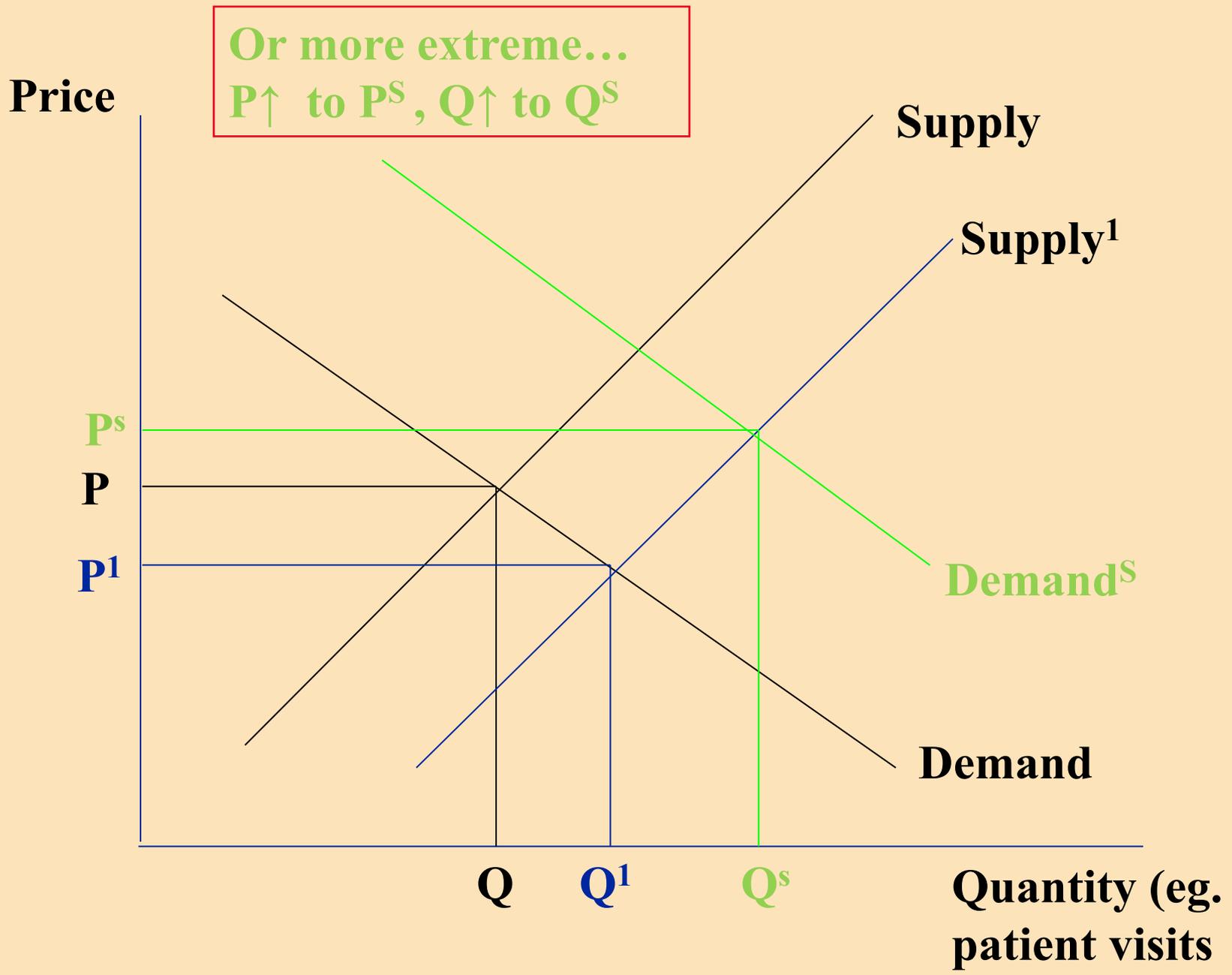
$Q$

$Q^1$

Quantity (eg.  
patient visits)



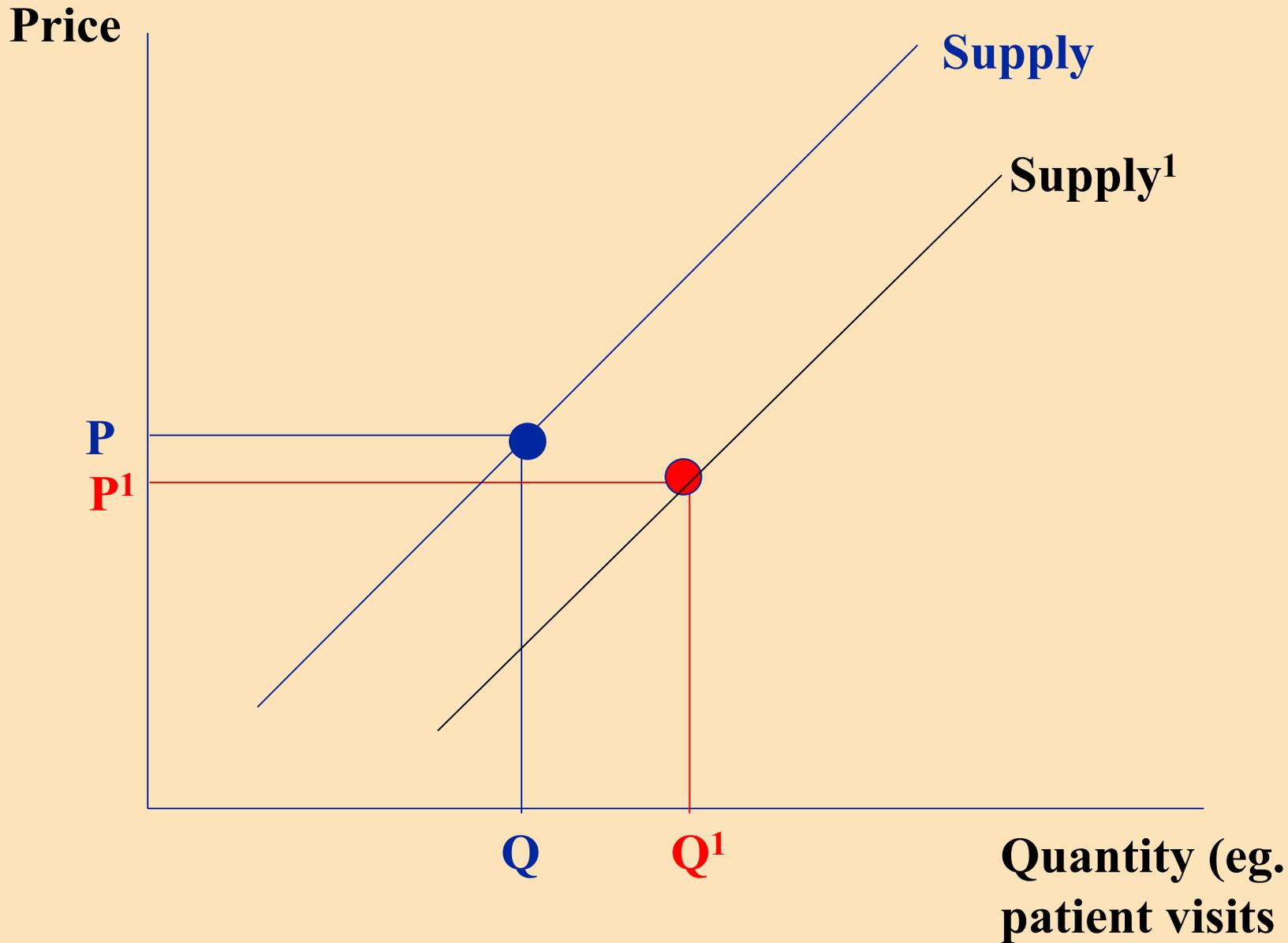


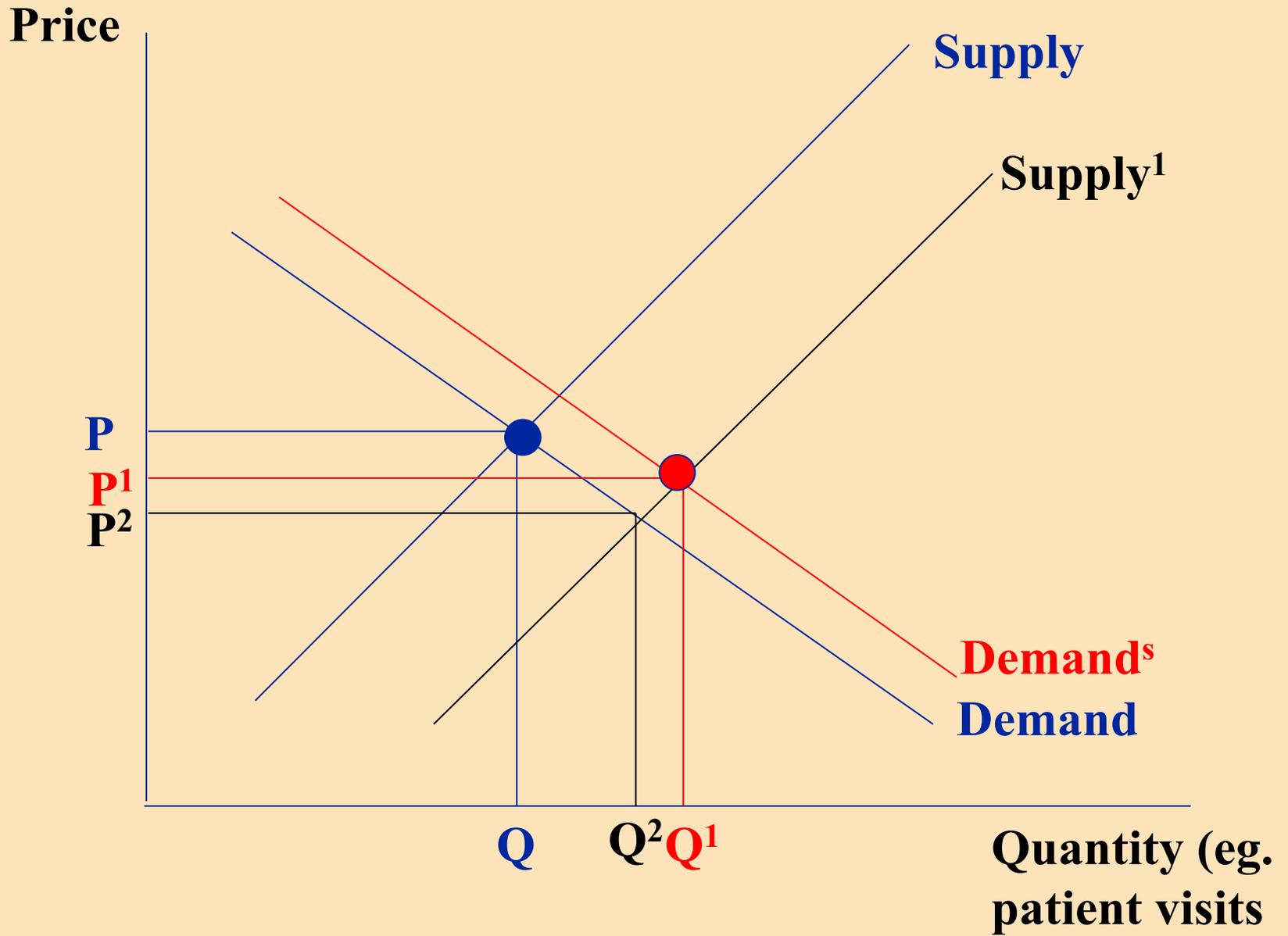


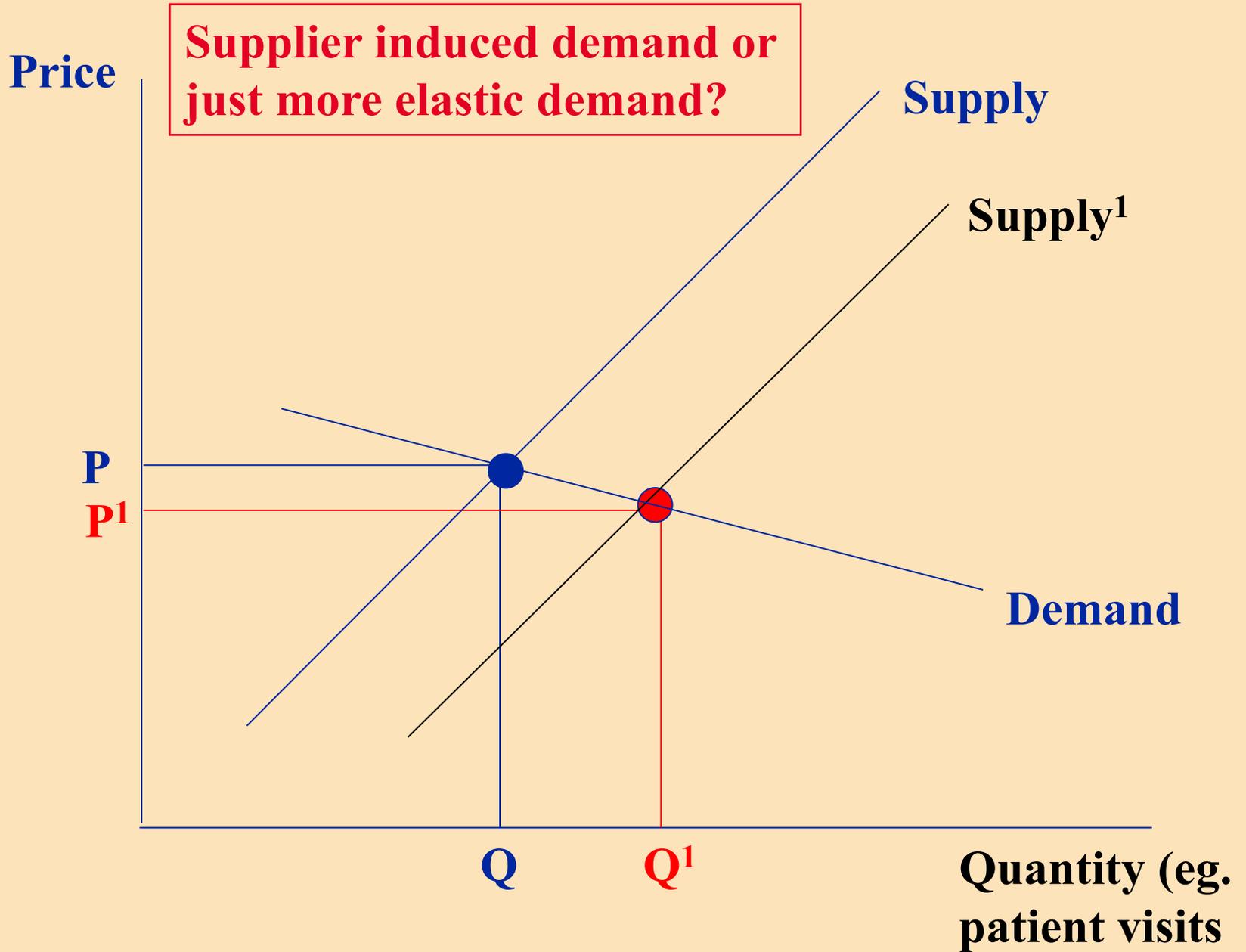
# *How likely are these scenarios?*

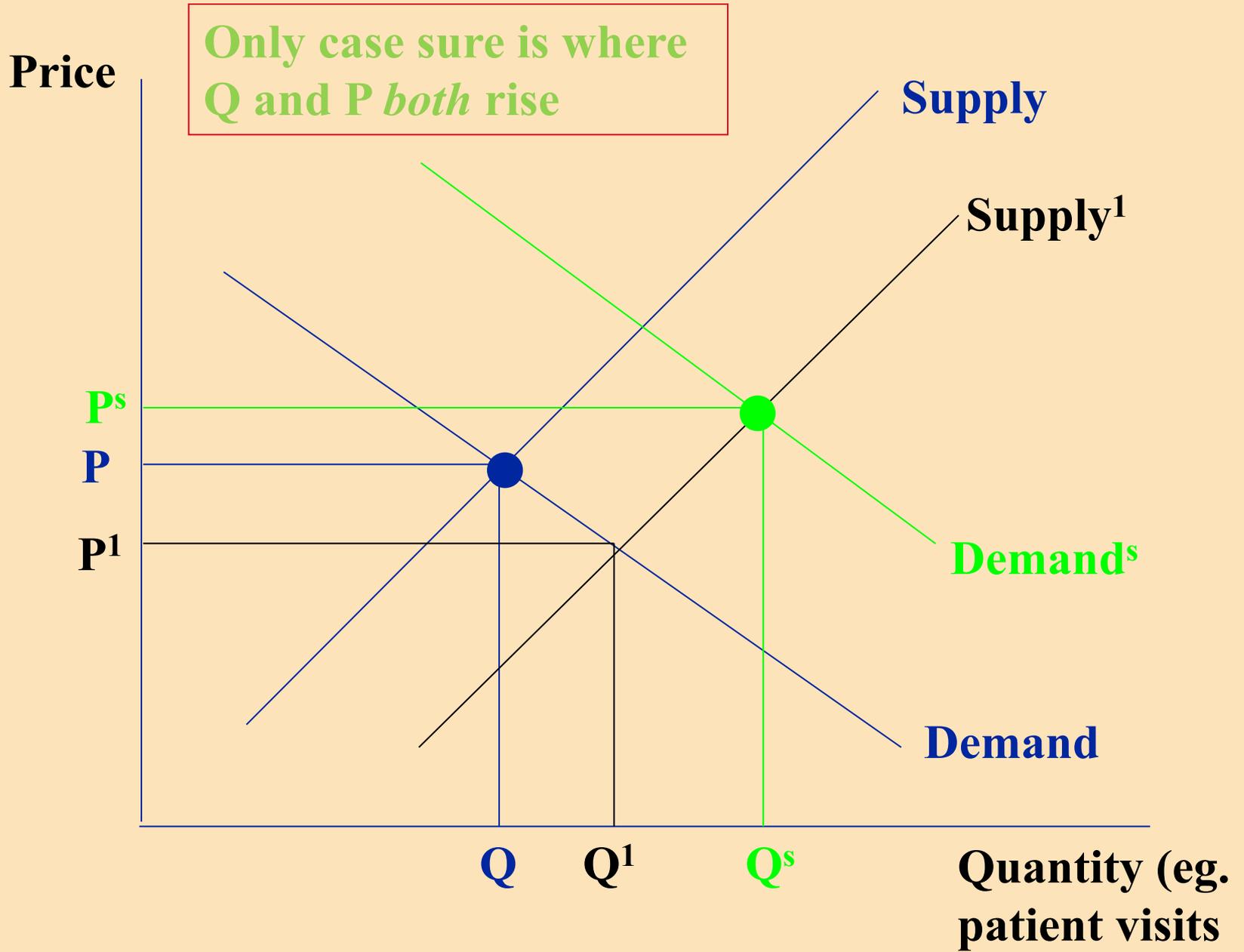
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- Context specific:
  - What *incentives* are there to induce demand?
  - What *constraints* are there on inducing demand?
  - Differences across disease areas – headache vs cancer (severity of consequences, repeatability)
- Significant factor is structure of health system
  - Patient payment (public/private insurance, OOP)
  - Doctor reimbursement (salary, FFS, targets etc)
- But problems in identifying (degree of) SID (eg identifying curves, uncertainty, etc)









Price

$P^s$

$P$

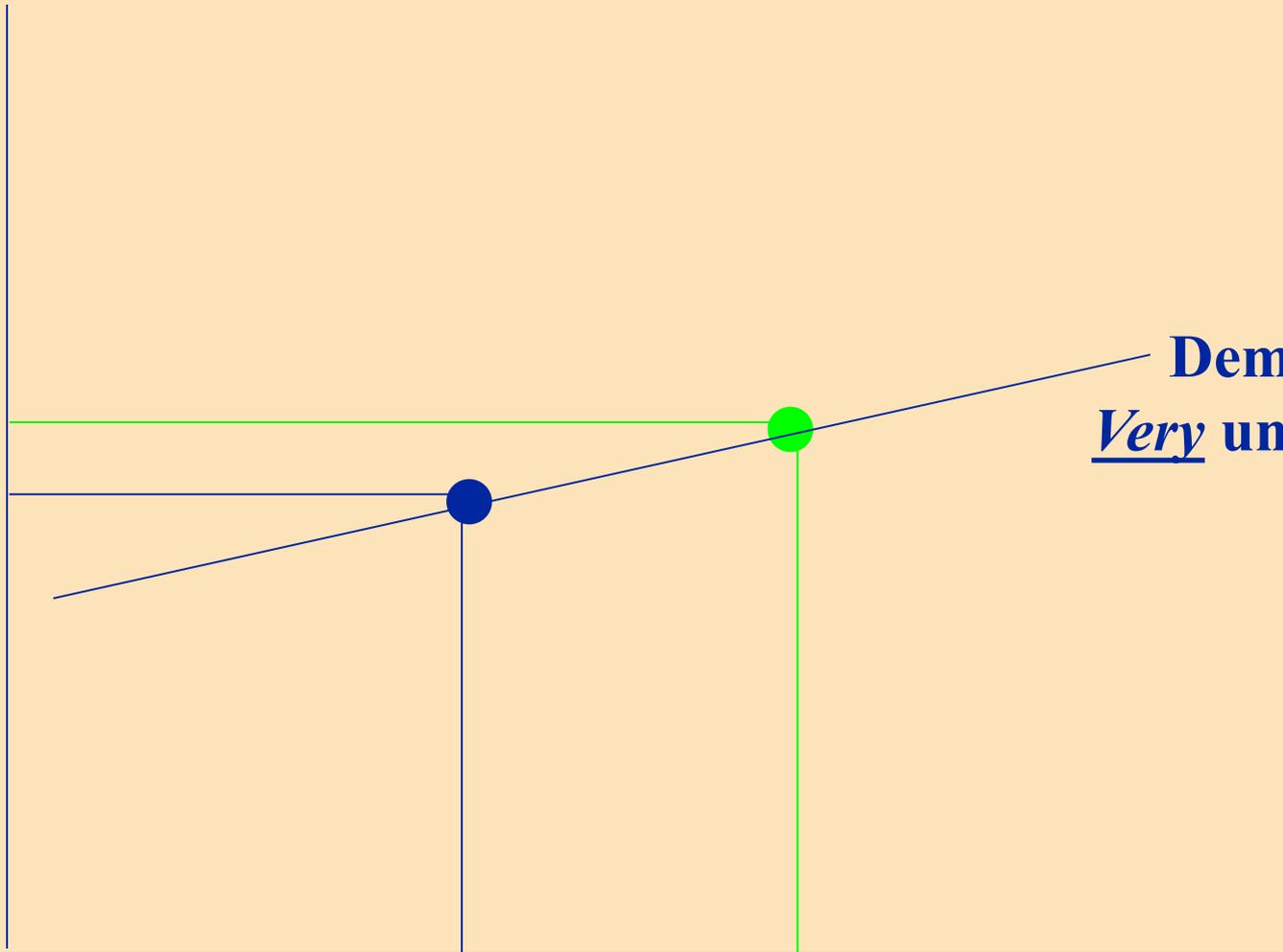
$Q$

$Q^s$

Quantity (eg.  
patient visits)

**Demand?**

**Very unlikely!**



# ***Example: Physician payment and Caesarean Section Delivery\****

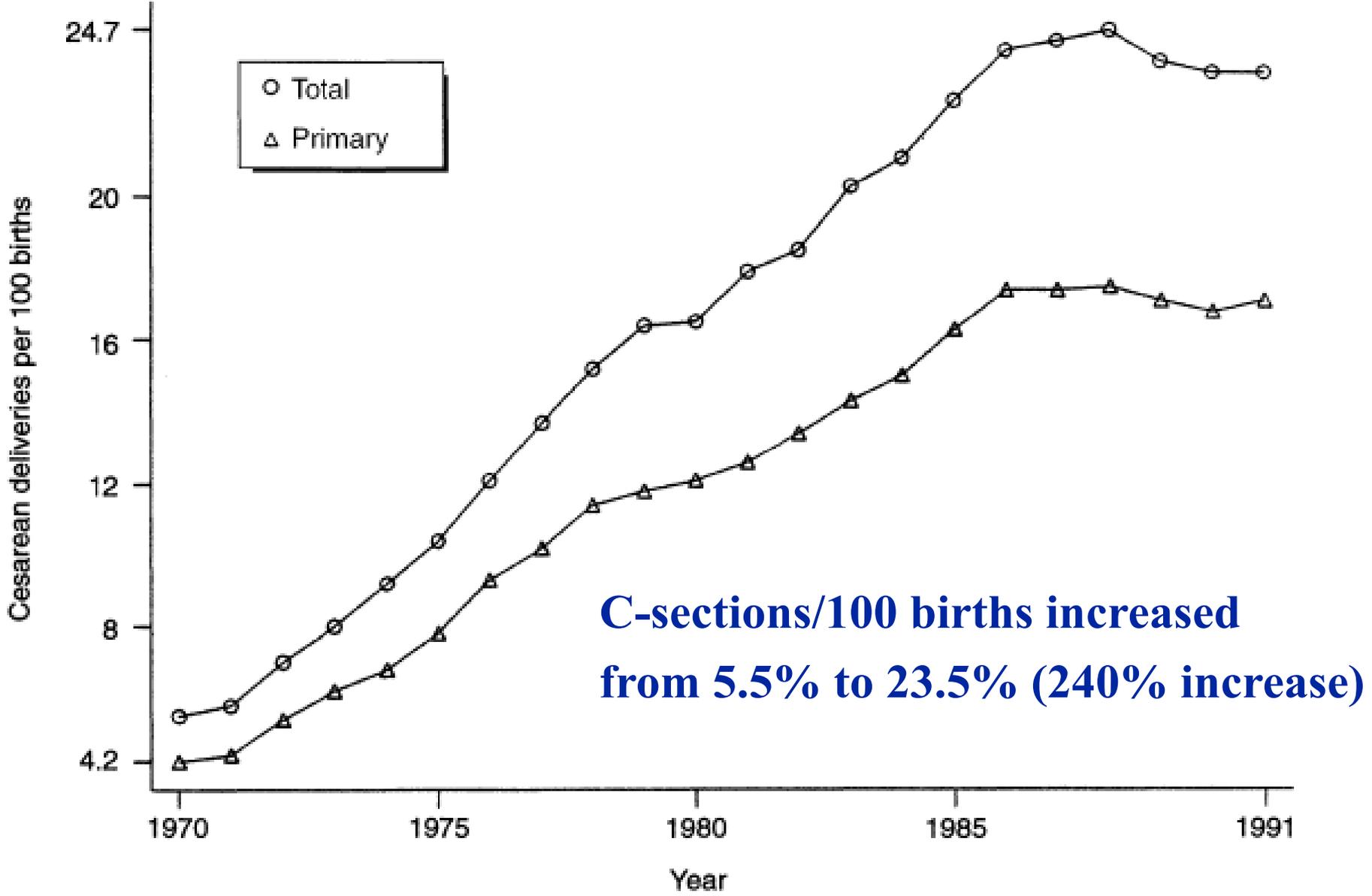
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- Fertility decline in US since 1970 is 'exogenous shock' to incomes of obs/gyn physicians (fall in demand for services)
- 13.5% decline in fertility implies 6.75% decline in income (from reduced births)
- Did physicians compensate by substituting more caesarean deliveries (making births more expensive)?

\*Gruber J, Owings M, Physician Financial Incentives and Cesarean Section Delivery. RAND Journal of Economics, 1996; 27(1): 99-123.

FIGURE 1

CESAREAN DELIVERIES IN THE UNITED STATES



# *Why might c-section rate increase?*

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- Introduction of technology to detect fetal distress
- Changes in legal environment increasing risk of medical malpractice suits
- Financial incentives
  - 1989: \$2053 for c-section vs. \$1492 for vaginal delivery (not justified by greater physician input)
  - Changes in private insurance coverage: limited coverage of normal childbirth, full coverage of c-section

# Results

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- Significant positive relationship between fertility rate and probability of c-section:
  - 10% fall in fertility associated with 1% increase in likelihood of caesarean delivery
  - Fertility decrease accounts for 16% of growth of c-section delivery over the period
- Conclusion: “Physicians overused caesarean delivery relative to the level that would be chosen by a financially disinterested provider ... but magnitude of response was fairly small”

# Summary of evidence on SID

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- Lot of anecdotal evidence
  - General Practice on-site diagnostics
  - Dentists
- Extensive, although mixed, empirical evidence through 1970's and 1980's, largely from US, Canada and Australia
  - Significant but relatively small effects
- Good summary of 'state of the art':
  - "physicians *can* induce demand for their services, they *sometimes do* induce demand, but such responses are neither automatic or unconstrained" (Hurley & Labelle, Health Econ; 1995: 420)

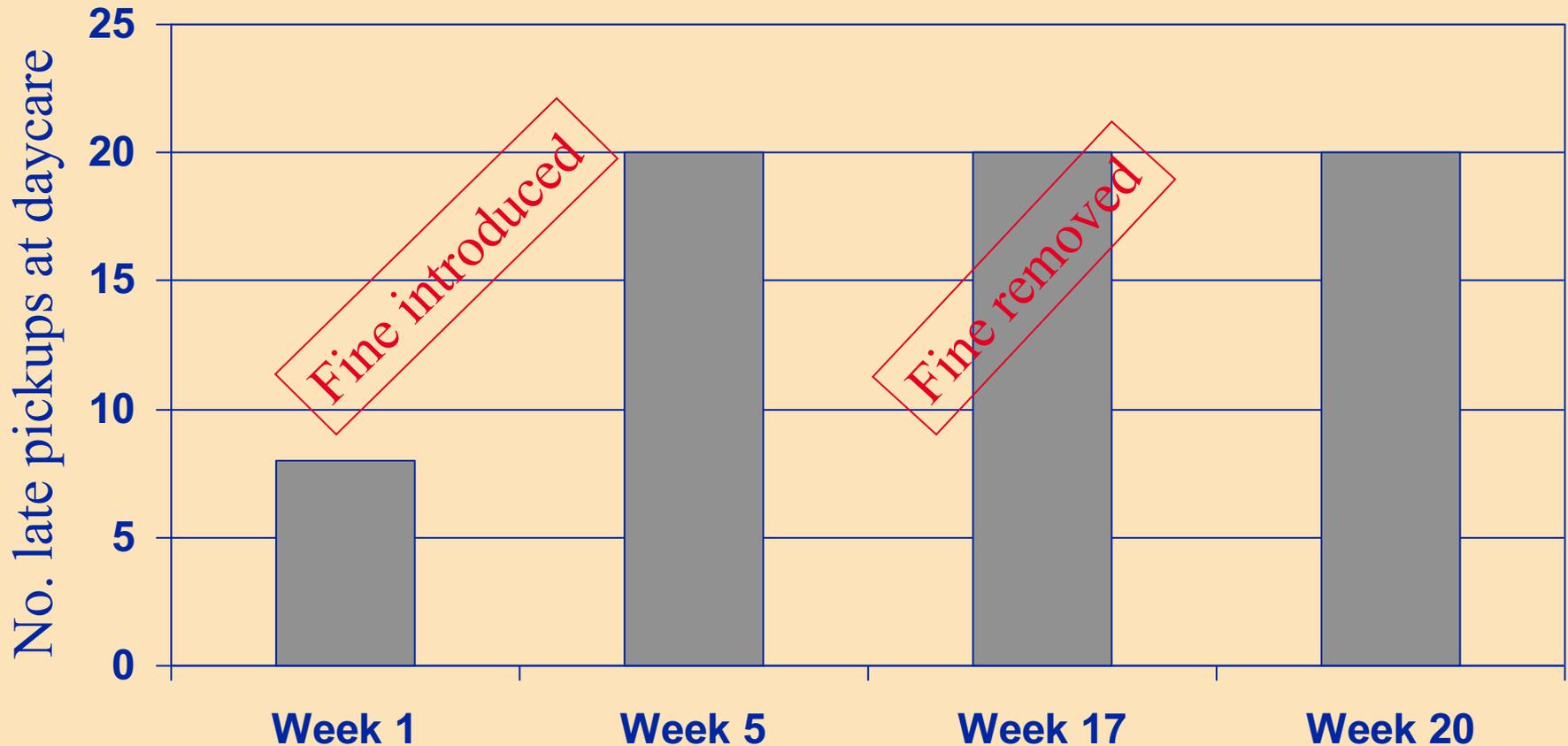
# *Implications of SID: incentives*

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- An incentive is simply a means by which someone is persuaded to do something
  - Typically, an incentive is seen to be a means of urging people to do more of a good thing and less of a bad thing, and a dis-incentive the reverse
- “The typical economist believes the world has not yet invented a problem that cannot be fixed if given a free hand to design the proper incentive scheme” (Levitt and Dubner, “Freakonomics”)
- Incentives can be financial, social or moral
- Incentives can be ‘perverse’ (careful design)

# *Moral vs. financial incentive*

*(from “Freakonomics”)*



Replacing a moral incentive with a (too small) financial incentive led to more late pickups!

# *Economic incentives*

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- Increasing income is a factor in anyone's motivation – even health professionals!
- Structure of health system will determine what incentives exist to provide 'appropriate' care. Eg
  - Fee-for-service: doctors have incentive to provide as many services as possible (potential over-servicing)
  - Salary/capitation: doctors have no financial incentive to provide a service (potential under-servicing)
  - Targets: doctors have incentive to meet target but not surpass, or not to strive if set too high
  - Third-party payment (private or social insurance): removes financial concern of consumer (patient) so easier to induce demand

# ***Nothing is perfect!***

***(Robinson, Millbank Quarterly, 2001, p149)***

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“There are many mechanisms for paying physicians: some are good and some are bad. The three worst are fee-for-service, capitation and salary. Fee-for-service rewards the provision of inappropriate services, the fraudulent upcoding of visits and procedures, and the churning of ‘ping-pong’ referrals among specialists. Capitation rewards the denial of appropriate services, the dumping of the chronically ill, and a narrow scope of practice that refers out every time-consuming patient. Salary undermines productivity, condones on-the-job leisure and fosters a bureaucratic mentality in which every procedure is someone else’s problem”

# ***SID not necessarily a bad thing!***

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- In some cases – such as where there are *positive externalities* – the market will under-provide the socially optimal level of utilization (eg vaccination) (see lecture 6)
- In this case incentives can be demand side (eg subsidize price) or supply side (create incentive for providers to induce demand by patient)
- In some cases, incentives for supply side may be more effective and/or efficient (eg immunization, CDC etc)

# A final word...

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- Health care characterized by *info. asymmetry* – suppliers better informed than consumers
  - Suppliers (professionals) therefore act as patient's *agent*, making decisions for them
  - Creates potential for *supplier-induced demand*
- Economists fascinated by SID because it runs counter to 'standard' market model
  - Contentious – existence accepted, but extent debated
  - Extent depends on structure of health system, especially financial *incentives*
- SID not always a 'bad thing' – may increase efficiency in some circumstances