

Lecture 1

Introduction to Constrained Optimization

Prof. Chris Makler
Econ 50 | Stanford University
January 5, 2016

Today

Hour 1: Lecture

Introductions

Econ 50 in context

Class policies

Upcoming deadlines

Hour 2: Group Work

Two Main Analytical Tools:

1. Constrained optimization
2. Comparative Statics

Introductions: about you

How many prospective econ majors? What other majors?

What are you hoping to get out of this course?

What have you heard about this course?

What do you like about econ? What don't you like?

Introductions: About me

B.A. in humanities, Ph.D. in economics

Main interest: economics education, microeconomics, matching

Courses taught at Stanford: 1A, 50, 51, 167 (Industrial Org.)

Professional life: education technology startups, Aplia, SRI

Current project: econgraphs.org

Econ 50 in Context

What is it actually?

How does it differ from Econ 1?

How does it prepare you for
Econ 51, 52, and the major?

What is Econ 50 about?

Econ 50 is about
how individual
economic agents
(consumers, firms)
make “optimal” choices

Consumer optimization:

Deriving **demand curves** from preferences, budgets

Extensions: intertemporal choice, labor supply

Producer optimization:

Deriving **cost curves** from production technologies

Deriving **supply curves** from those cost curves

Optimization with market power:

Monopoly, monopsony, cartel profit maximization

How does Econ 50
differ from Econ 1?

Demand

Econ 1

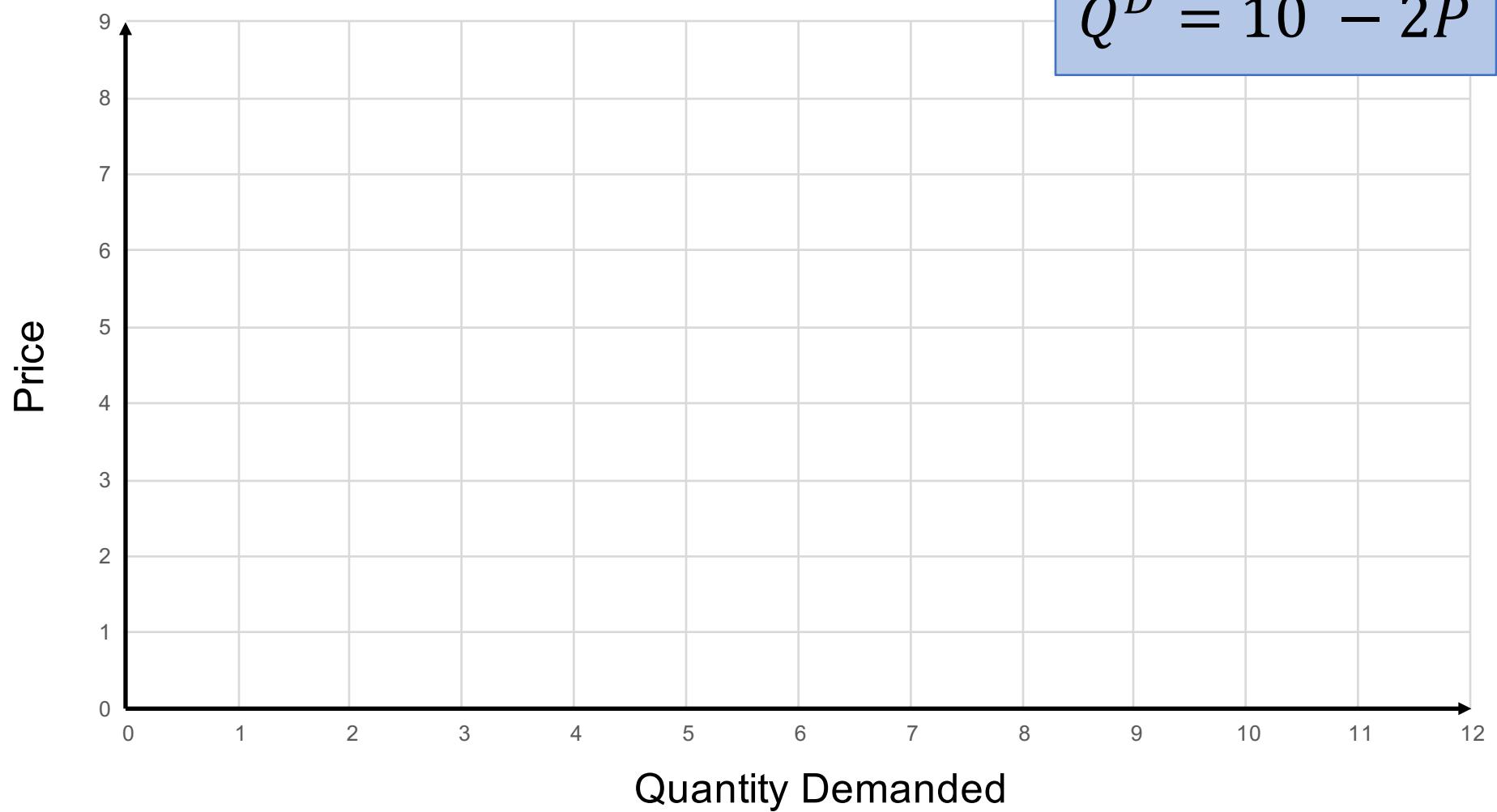
$$Q^D = 10 - 2P$$

“A change in price in another good shifts the demand curve”

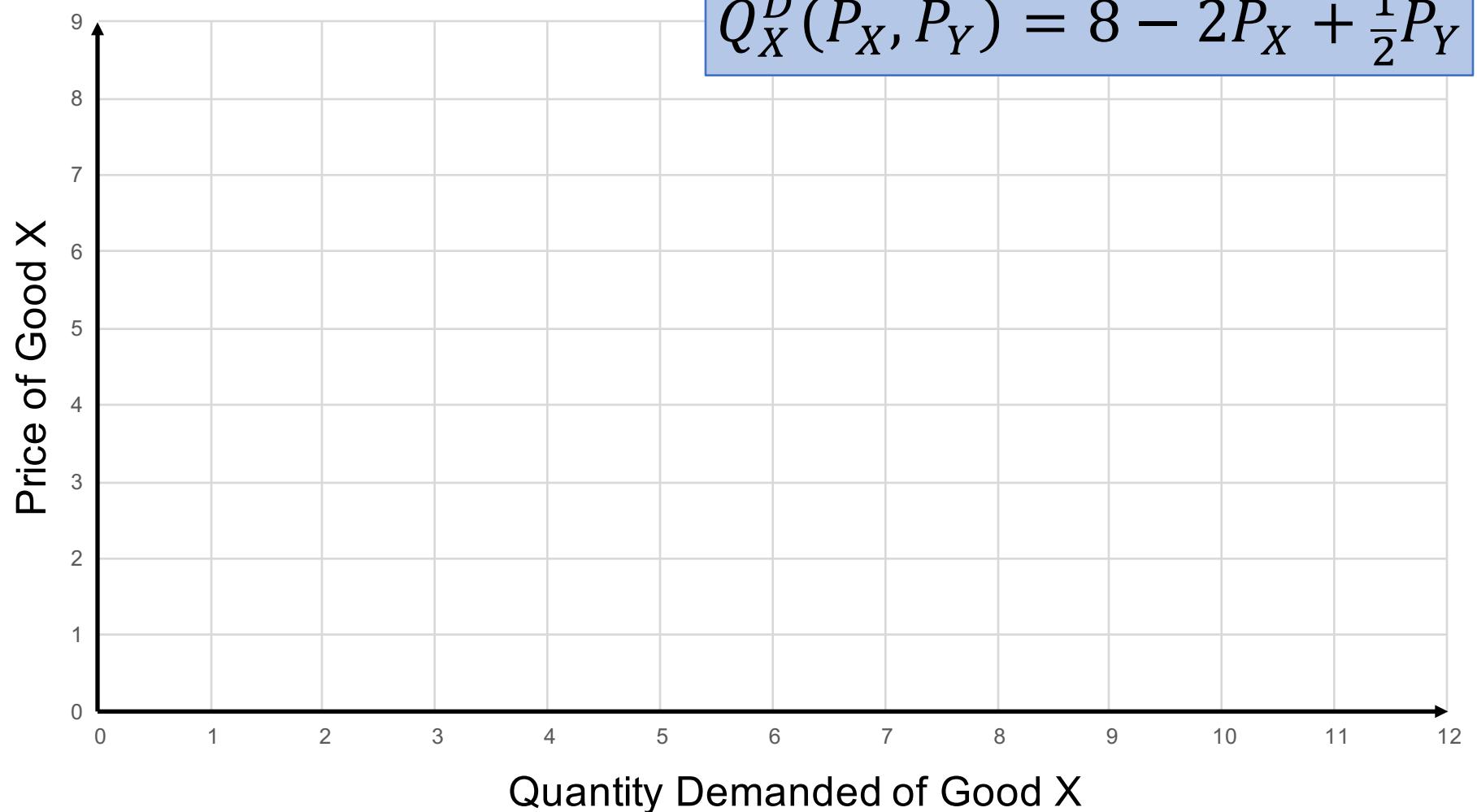
Econ 50

$$Q_X^D(P_X, P_Y) = 8 - 2P_X + \frac{1}{2}P_Y$$

$$Q^D = 10 - 2P$$



$$Q_X^D(P_X, P_Y) = 8 - 2P_X + \frac{1}{2}P_Y$$



Total and Marginal Cost

Econ 1

$$TC = FC + VC$$

“MC is the cost
of producing
one more unit”

Econ 50

$$c(q) = r\bar{K} + wL(q)$$

Profit Maximization

Econ 1

“A competitive firm maximizes profits by setting...”

$$P = MC$$

Econ 50

$$\pi(q) = Pq - c(q)$$

How does Econ 50
lead into Econ 51 and 52?

INDIVIDUALS



MARKETS



ECONOMIES



Econ 50

Econ 51

Econ 52



Econ 50: Models of **optimization**

Econ 51: Models of **interaction**

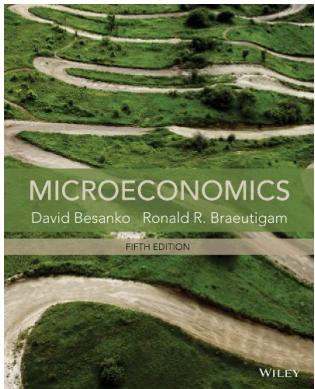
Econ 52: Models of **policy**

Throughout: ***Comparative Statics***
– response to change

Class Policies

All the details are in the syllabus;
read it carefully!

Textbooks

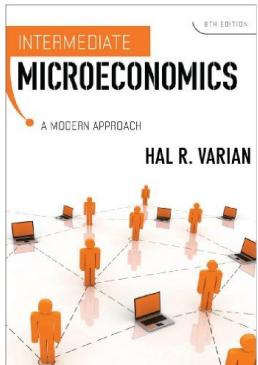


David Besanko & Ronald Braeutigam

Microeconomics, 5e

More basic than the course

Required; used for HW problems, readings



Hal Varian

*Intermediate Microeconomics:
A Modern Approach, 8e*

More advanced than the course

Optional; useful if you are serious about econ

Lectures 1-3	Modeling tools	B&B Ch. 1-2
Lectures 4-7	Consumer choice	B&B Ch. 3-4
Lectures 8-11	Deriving demand	B&B Ch. 5
<i>Midterm: February 11 (in class)</i>		
Lectures 12-14	Producer choice	B&B Ch. 6-8
Lectures 15-17	Deriving supply	B&B Ch. 9-10
Lectures 18-19	Market power	B&B Ch. 11
<i>Final: March 16, 12:15-3:15pm</i>		

Hour 1: Lecture

Purpose: build intuition

PowerPoint, interactive graphs,
derivations, discussion

NO LAPTOPS OR PHONES

Hour 2: Group Work

Purpose: build facility

Problems similar to HW/tests,
simulations, games

LAPTOPS CAN BE USEFUL

Section: Every Friday

Every Friday starting 1/15; no section 2/12

Purpose: practice and feedback

Great participation can “bump” your grade

Join via Coursework

Homeworks: 25% of grade

Due every Friday at beginning of section,
starting next week

If you have to miss section, may be
submitted online or by fax by 10am

No extensions, but your lowest score is
dropped

Midterm: 30% of grade

Thursday, February 11, in class

No makeup exams. If you cannot take the midterm, your grade will be based on HW & final – but you must let me know this before the exam!

Final: 45% of grade

Wednesday, March 16, 12:15-3:15pm.

No makeup finals. Any accommodations (e.g., athletes traveling) must be made ahead of time.

Formal policies

Students with disabilities:

studentaffairs.stanford.edu/oae

Econ department common syllabus:

economics.stanford.edu/undergraduate/economics-common-syllabus

Regrade requests **must go to DUS**, not me.

Online Resources

Coursework: all class logistics (sections, homework, etc)

coursework.stanford.edu/portal/site/W16-ECON-50-01

Piazza: all class communication (announcements, questions)

piazza.com/stanford/winter2016/econ50

EconGraphs: all course materials (slides, interactive graphs)

econgraphs.org/courses/stanford/W16-ECON-50