

Economics 1: Fall 2010

J. Bradford DeLong, Michael Urbancic, and a
cast of thousands...

http://delong.typepad.com/econ_1_fall_2010/

Ladies and Gentlemen, to Your iClickers...

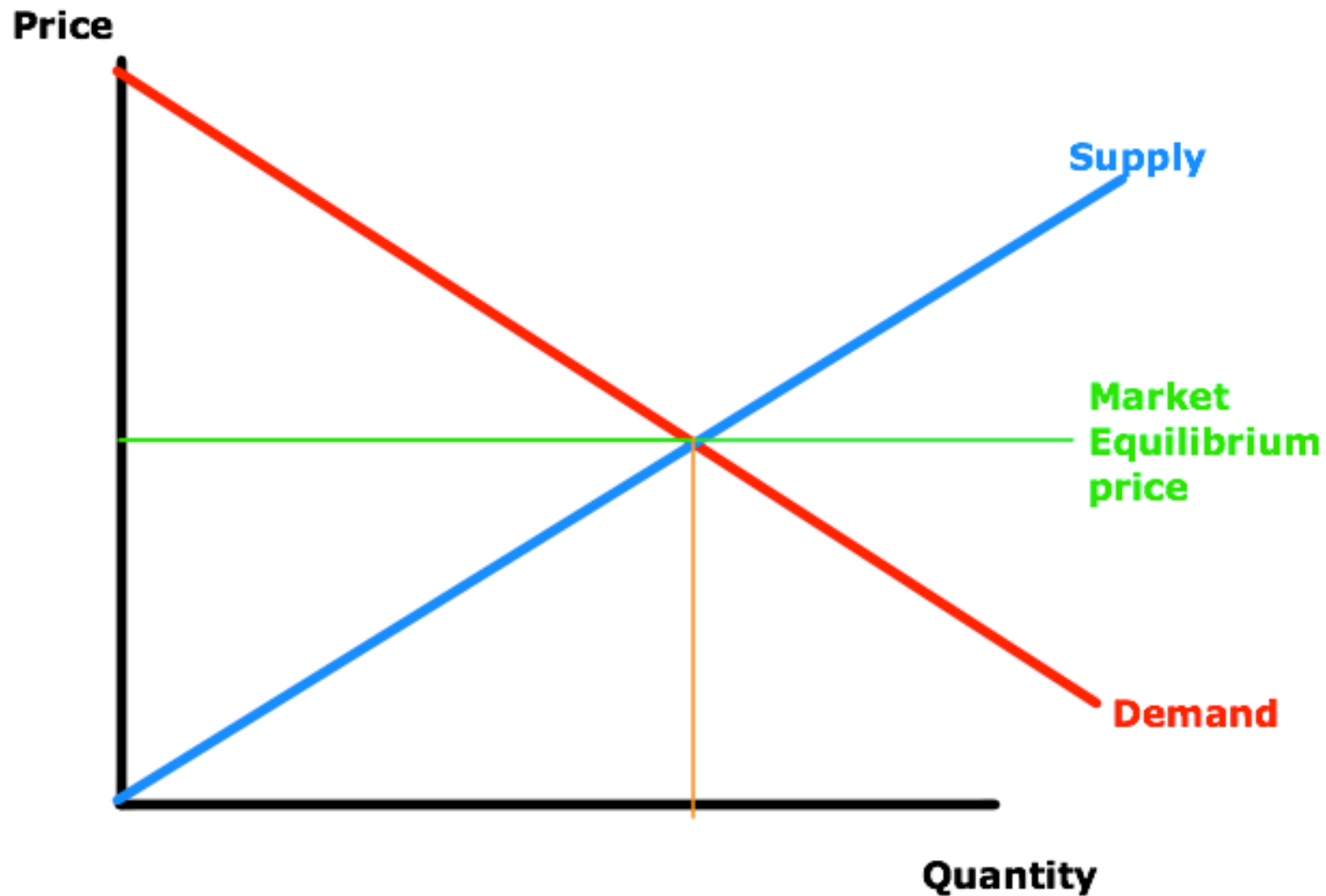
- What is the big reason to impose taxes (or bounties) rather than use command-and-control to limit quantities (or draft participants)?
 - A. Market signals allow people to choose what they want to do
 - B. Command-and-control may put the wrong people in places they should not be
 - C. Command-and-control will greatly reduce consumer plus producer surplus
 - D. Command-and-control will create a favored group that would lose from reversion to the market outcome
 - even though social surplus would be increased

Economics 1: Fall 2010: General Equilibrium

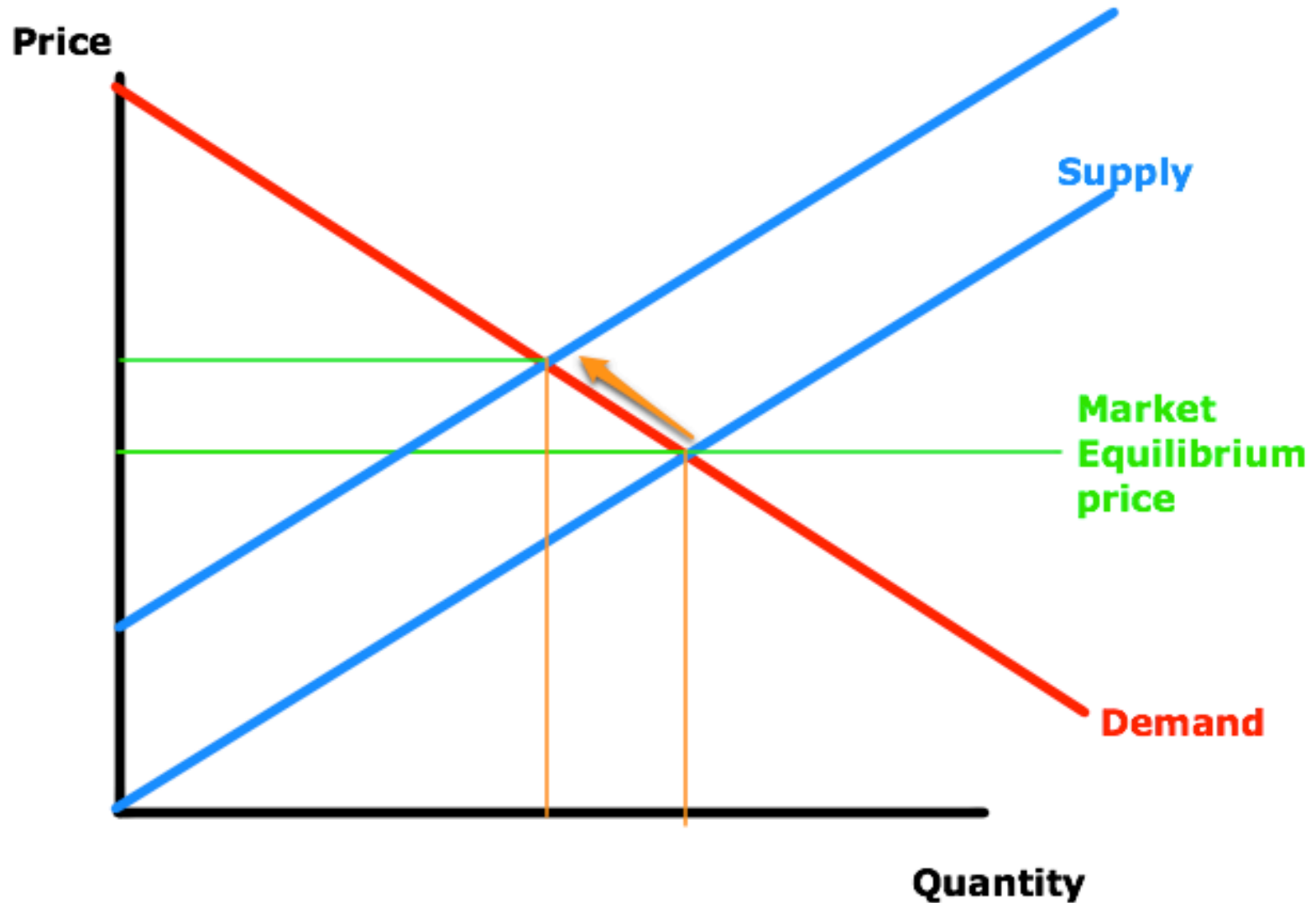
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So Far We Have Assumed the Rest of the Economy Is Stable



Working with Demand and Supply Curves: In-Up Shift in Supply Curve

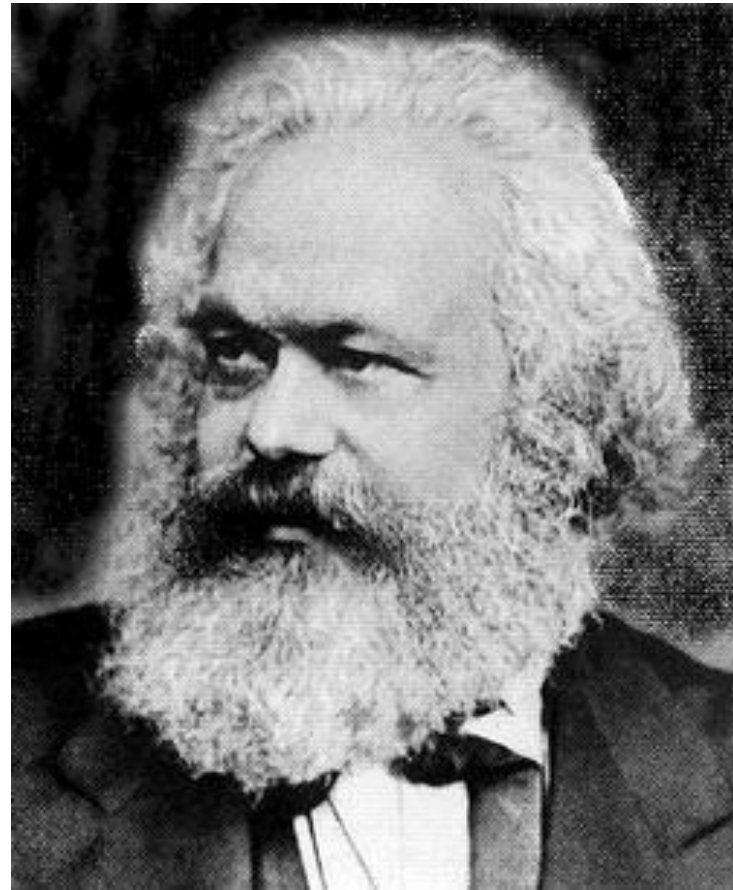


A Single Market Will Have an Equilibrium

- If you make three assumptions:
 - That when price is high, demand is sufficiently low
 - That when price is low, demand is sufficiently high
 - That small changes in prices call forth small changes in demand and supply
- But does the same thing apply to the economy as a whole?
 - If all markets but one are in balance, and if you then move the price in the one-out-of-balance market
 - That will throw off demand or supply or both in other markets
 - Is there anything that guarantees, or even makes it likely, that the economy as a whole will have a competitive market equilibrium?

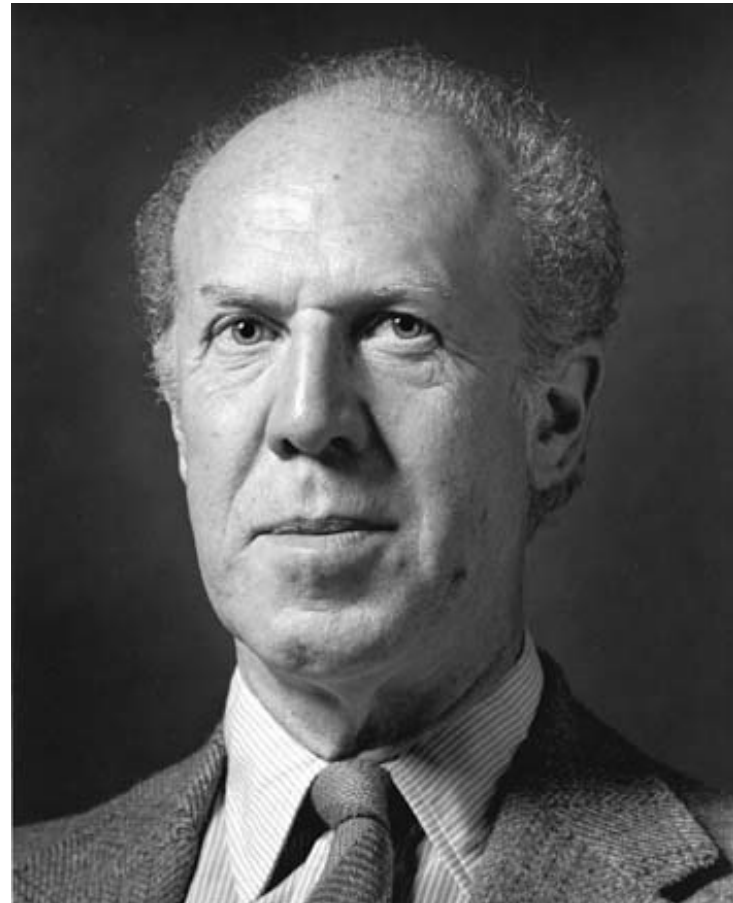
Karl Marx Said No

- Karl Marx said:
 - John Stuart Mill is an idiot
 - Mill has only demonstrated the possibility of crisis, when he should have demonstrated their necessity
 - If financial markets are in balance, there will be a reserve army of the unemployed
 - If labor markets are in balance, finance will be in an unsustainable bubble
 - Hence even competitive markets are an unsustainable and inhumane social system



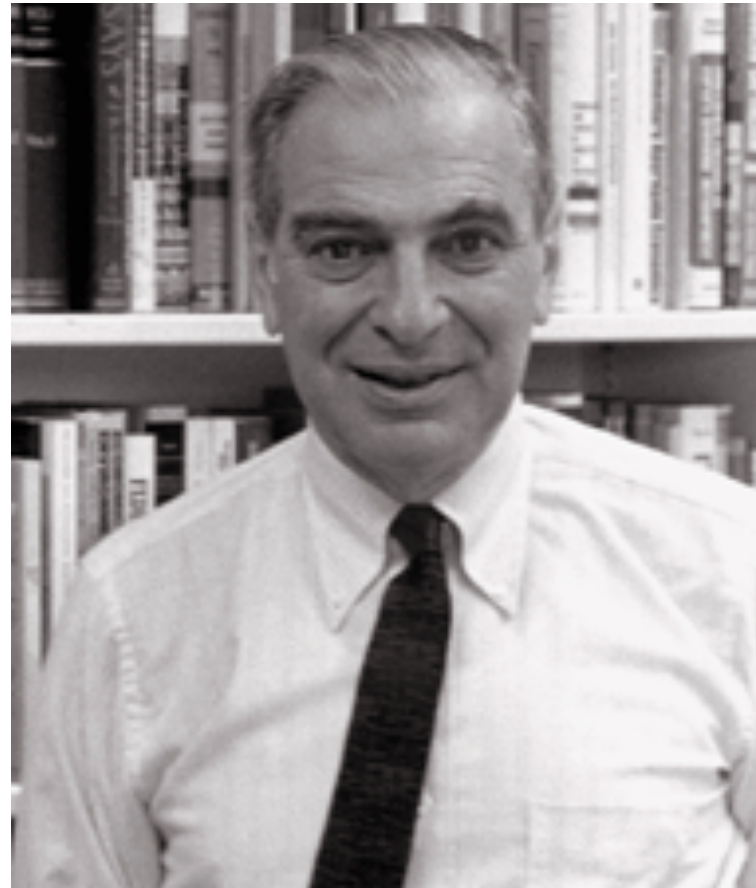
Gerard Debreu and Ken Arrow Say Yes

- Under certain conditions and with certain assumptions, of course...
- ...a competitive market general equilibrium system will have at least one equilibrium



As Adjustments Propagate Through Related Markets and Generate Further Adjustments...

- ...the process will eventually reach a stopping point
- There will be a set of prices in the economy at which all the demands in all the markets will equal supplies



It Is Worth Seeing How This Adjustment Process Works—Once

- So let us see how it all fits together...
 - The problem is that to do anything in class, you have to use a toy model that is, well, somewhat stupid: but we hope that the insights from it generalize
So let us rev up our toy model...
 - Yes, it is yoga teachers and baristas once again...
- But now we have a lot of markets—not just one:
 - Demand and supply for yoga lessons
 - Demand and supply for coffee
 - What blue-collar workers are doing makes sense
 - What white-collar workers are doing makes sense
 - Fitness businesses are covering their costs (and also not making exorbitant profits)
 - Coffee bars are covering their costs (and also not making exorbitant profits)
 - So we are going to have six different equilibrium conditions to check—not just one—and we only have two commodities and two factors of production

Ladies and Gentlemen, to Your iClickers

- The principal reason to let self-interested buyers and sellers in a market economy find your equilibrium, rather than assemble gigantic computing machines to do it, is:
 - A. The computational task is much too great
 - B. People have too great an incentive to cheat—and nobody has a big incentive to catch them
 - C. Central planning can only deal with the known unknowns, while decentralized human initiative can also deal with the unknown knowns and the unknown unknowns

Our Toy Economy: Setup I

- Factor supply:
 - 20 white-collar workers, trained as yoga instructors, can also be baristas
 - 120 blue-collar workers, who can be either baristas or yoga assistants
- Production
 - Yoga:
 - Two blue collar yoga instructors can teach one student a day.
 - Two white collar yoga instructors can teach five students a day.
 - One white collar yoga instructor plus one blue collar assistant can also teach five students a day
 - As long as the blue-collar wage is lower than the white-collar wage, teams are best
 - Coffee:
 - One barista (blue collar or white collar) can make ten cups of coffee a day
 - That pins the real wage of blue-collar workers at ten cups of coffee a day

Our Toy Economy: Setup II

- Households
 - Everybody spends half their income on coffee, and half on yoga lessons
- For what firms are doing to make sense:
 - The cost of hiring an instructor and an assistant is equal to the revenue from their teaching
 - The cost of hiring baristas is equal to the revenue from their brewing
- Labor:
 - Everybody wants to work

Our Toy Economy: Equilibrium I

- Production
 - 20 instructors plus 20 assistants offer yoga instruction to 100 students a day—unless the price of yoga drops really low
 - 100 baristas brew 1000 cups of coffee a day
- Prices
 - w^b : wage of blue-collar workers
 - w^w : wage of white-collar workers
 - p^c : price of coffee
 - p^y : price of yoga lessons
 - Three prices or four?

Our Toy Economy: Equilibrium II

- Equilibrium conditions:
 - Firms must cover their costs in yoga:
 - $20w^b + 20w^w = 100p^y$
 - Firms must cover your costs in coffee:
 - $100w^b = 1000p^c$
 - Demand must equal supply for coffee:
 - $\frac{1}{2} \times (120w^b + 20w^w) = 1000p^c$
 - Demand must equal supply for yoga:
 - $\frac{1}{2} \times (120w^b + 20w^w) = 100p^y$

Ladies and Gentlemen, to Your iClickers

- 1 barista working in a coffee bar can brew 10 cups of coffee a day. This means that the equilibrium wage of blue-collar baristas will be equal to the price of:
 - A. 5 cups of coffee a day
 - B. 10 cups of coffee a day
 - C. 20 cups of coffee a day
 - D. 40 cups of coffee a day
 - E. 60 cups of coffee a day

This Is a Rigged Example

- I have rigged this example so that you don't have to solve any systems of equations at all:
 - Coffee firms: $100w^b = 1000p^c$
 - The real wage for blue-collar baristas: $w^b/p^c = 10$

Ladies and Gentlemen, to Your iClickers

- Everybody spends half their income on coffee. That means that demand in the coffee market is $\frac{1}{2} \times (120w^b + 20w^w)$ and supply is $1000p^c$. We know that the blue-collar wage is 10 cups of coffee. Thus:
 - $\frac{1}{2} \times (120 \times 10p^c + 20w^w) = 1000p^c$.
- That means that the equilibrium wage of white-collar yoga instructors is:
 - A. 5 cups of coffee a day
 - B. 10 cups of coffee a day
 - C. 20 cups of coffee a day
 - D. 40 cups of coffee a day
 - E. 60 cups of coffee a day

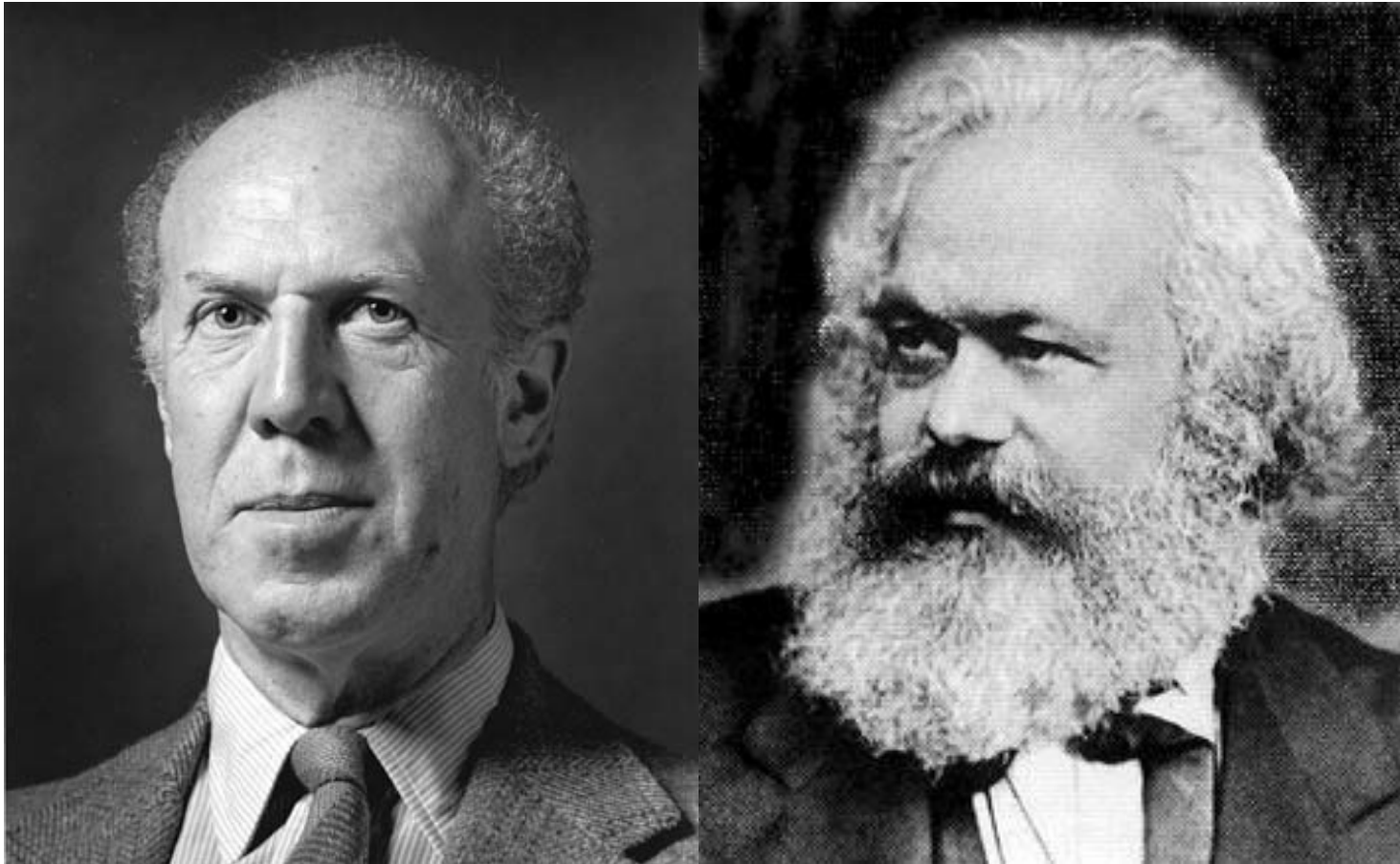
This Is a Rigged Example

- I have rigged this example so that you don't have to solve any systems of equations at all:
 - The coffee market: $\frac{1}{2} \times (120 \times 10p^c + 20w^w) = 1000p^c$
 - $w^w/p^c = 40$
 - Last, the yoga market: the earnings of assistants and yoga instructors have to match revenue: $20(10p^c) + 20(40p^c) = 100p^y$
 - $p^y/p^c = 10$
 - Yoga firms?
 - We don't have to solve it—we already have our answers...

Our Market General Equilibrium

- Coffee:
 - 100 blue-collar workers producing 1000 cups
- Yoga
 - 20 white-collar instructors plus 20 blue-collar assistants producing 100 lessons
- Prices:
 - $w^b/p^c = 10$
 - $w^w/p^c = 40$
 - $p^y/p^c = 10$
- Blue-collar workers:
 - Earning a wage of 10 cups of coffee a day
 - Spending it half on coffee—5 cups—and the rest on yoga lessons— $\frac{1}{2}$ a yoga lesson a day
- White-collar workers:
 - Earning a wage of 10 cups of coffee a day
 - Spending it half on coffee—20 cups—and the rest on yoga lessons— 2 yoga lessons a day

See? It All Adds Up! Karl Marx Was Wrong! Gerard Debreu Was Right!



Ladies and Gentlemen, to Your iClickers

- The principal reason to let self-interested buyers and sellers in a market economy find your equilibrium, rather than assemble gigantic computing machines to do it, is:
 - A. The computational task is much too great
 - B. People have too great an incentive to cheat—and nobody has a big incentive to catch them
 - C. Central planning can only deal with the known unknowns, while decentralized human initiative can also deal with the unknown knowns and the unknown unknowns

Let's Go a Little Further

- Suppose things change in the economy...
- Can the market find its new equilibrium?
- Suppose that the computer revolution comes:
 - It means that you no longer have to have an assistant to run a yoga class
 - The 20 white-collar yoga instructors can teach their five yoga students a day without assistance
- This is a good thing for society as a whole
 - We now are making what we made before, but we have 20 blue-collar workers that we can redeploy to make other useful things
 - This episode of technological change makes us richer
- And the market economy in general equilibrium will go off and find its new equilibrium
 - What will it be like?
 - Start by noting that the extra 20 blue-collar workers all go off to make more coffee: that is their best alternative use now that they are no longer needed as yoga assistants.

Technological Change Makes Us Richer

- This computer revolution ought to be a good thing for society as a whole
 - We now are making what we made before, but we have 20 blue-collar workers that we can redeploy to make other useful things
 - This episode of technological change makes us richer
- And the market economy will indeed go off and find its new equilibrium
 - What will it be like?
 - Start by noting that the extra 20 blue-collar workers all go off to make more coffee: that is their best alternative use now that they are no longer needed as yoga assistants.

The New Equilibrium

- Our new equilibrium conditions:
 - Supply and demand for coffee: $\frac{1}{2} \times (120w^b + 20w^w) = 1200p^c$
 - Supply and demand for yoga: $\frac{1}{2} \times (120w^b + 20w^w) = 100p^y/p^c$
 - Yoga firms: $20w^w = 100p^y$
 - Coffee firms: $120w^b = 1200p^c = 1200p^c$
- We still don't have to solve any systems of equations at all:
 - Cover your costs in coffee: $w^b/p^c = 10$
 - Demand and supply for coffee: $\frac{1}{2} \times (120 \times 10 + 20w^w) = 1200p^c$
 - $10w^w/p^c = 600$
 - $w^w/p^c = 60$
 - Yoga firms: $20(60) = 100p^y/p^c$
 - $p^y/p^c = 12$

Comparing the Equilibria

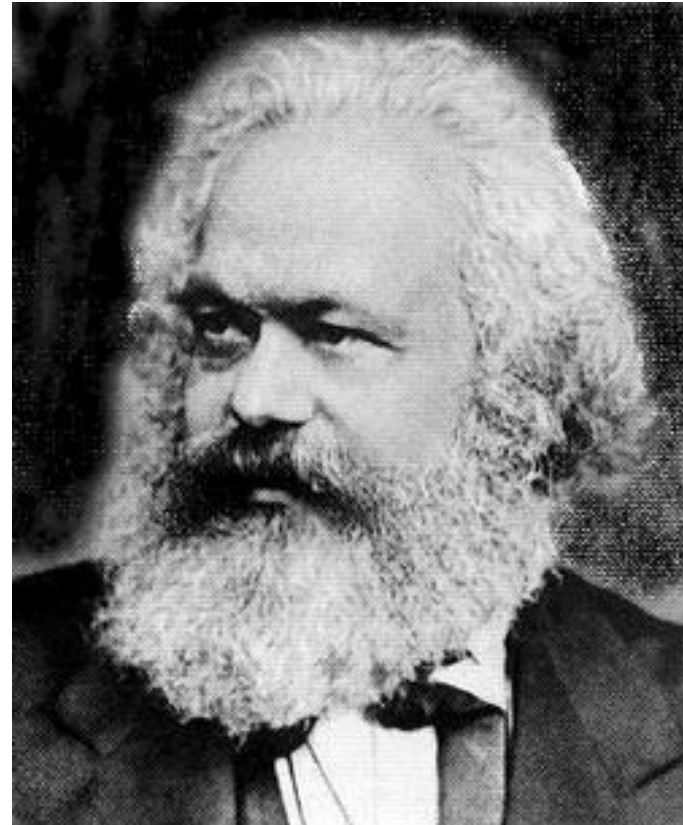
- Prices:
 - $w^b/p^c = 10$ before, and $= 10$ after
 - $w^w/p^c = 40$ before, and $= 60$ after
 - $p^y/p^c = 10$ before, and $= 12$ after
- Consumption:
 - Blue collar workers:
 - Consume 5 cups of coffee and $\frac{1}{2}$ a yoga lesson a day before,
 - Consume 5 cups of coffee and $\frac{5}{12}$ of a yoga lesson a day after
 - White collar workers:
 - Consume 20 cups of coffee and 2 yoga lessons a day before,
 - Consume 30 cups of coffee and $2\frac{1}{2}$ yoga lessons a day after

What the Fracking Frack?

- This episode of technological change was not a good deal for everyone
- Consumption:
 - Blue collar workers consume 5 cups of coffee and $\frac{1}{2}$ a yoga lesson a day before, and 5 cups of coffee and $\frac{5}{12}$ of a yoga lesson a day after
 - They have lost $\frac{1}{12}$ of a yoga lesson, or $\frac{1}{12}$ of their total consumption
 - White collar workers consume 20 cups of coffee and 2 yoga lessons a day before, and 30 cups of coffee and $2\frac{1}{2}$ yoga lessons a day after
 - They have gained 10 cups of coffee plus half a yoga lesson, or $\frac{15}{40}$ of their total consumption

The Market Gives You What You Want to Buy—Only If You Have Something Valuable to Sell

- How did increased productivity in the provision of yoga lessons leave blue-collar workers worse off?
- What do blue collar workers have to sell that is valuable?
- Well, as Karl Marx would put it, they have their labor power and only their labor power
- And the coming of the computer revolution makes blue-collar labor power less needed and hence less valuable



How to Evaluate This Change?

- Place everyone “behind the veil of ignorance” and have them decide...
- In changes:
 - 1/7 of the population gains consumption equal to 15 cups of coffee
 - 6/7 loses consumption equal to 5/6 of a cup of coffee
 - $15 \times 1/7 - 6/7 \times 5/6 = (15-5)/7 = +10/7$
 - Place people behind the veil of ignorance...
- In percentage changes:
 - 1/7 of the population gains consumption equal to 37.5% of their initial consumption
 - 6/7 loses consumption equal to 8.3% of their initial consumption
 - $1/7 \times 37.5\% - 6/7 \times 8.3\% = -1.8\%$
 - Place people behind the veil of ignorance...
- The answer hinges on the marginal utility of wealth, and on the weight our assessment of social welfare places on different individuals
- Is it legitimate to place people behind the veil of ignorance?

Test Your Knowledge

- Why did Karl Marx think there would be no stable expectations-consistent general equilibrium?
- What markets do we have to think about when we try to solve a general equilibrium problem?
- What happens to your standard of living if technological progress makes your labor power (and the other factors you own) less valuable?
- How should we assess whether economic changes are on balance good or bad?