

# Teaching AP Economics through Simulations

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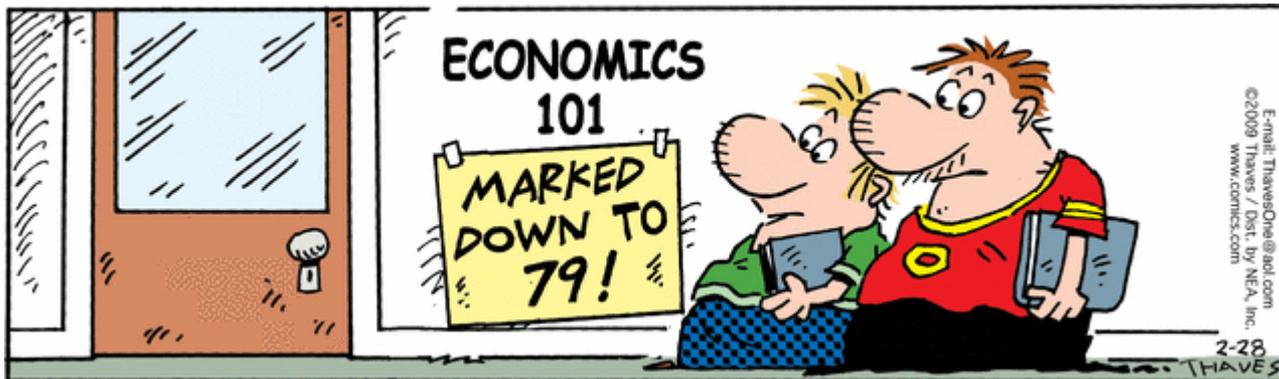
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# A major problem

... it's true, economics can come across as pretty boring. It is a singular achievement of the economics profession that it has managed to make the study of our daily lives and interactions about as exciting as a maths quiz.

Jessica Irvine (2012), *Zombies, Bananas and Why There are No Economists in Heaven*, p. 1



# What are simulations?

- ▶ A simulation typically combines a mixture of skill, chance and strategy to simulate an aspect of reality, such as a stock exchange.



# Why should we use simulations to teach AP Economics?

- ▶ Simkins (1999) stated “... *teaching practices, which rely heavily on the lecture format, are not doing enough to develop students’ cognitive learning skills, attract good students to economics, and motivate them to continue coursework in the discipline.*”
- ▶ The American Economic Review by Allgood (2004) showed that students “rarely take economics as a free elective - especially beyond principles.”
- ▶ More is needed to be done in the classroom to excite students about economics education.

# The key benefits of simulations and games as teaching and learning tools include:

- ▶ Promotes greater student involvement. Simulations help provide a learning environment in which students are more active participants, which enhances learning.
- ▶ Improves student motivation.
- ▶ Increases the realism and relevance of class material.
- ▶ Provides further integration of principles.
- ▶ Provides students with experience in analysis and critical thinking.
- ▶ Provides a vehicle through which students can sharpen interpersonal and communication skills.

# What are some tips in selecting a simulation game for teaching economics to improve learning?

Choose a simulation game that:

- ▶ Is used or made by reputable associations, universities and colleges, and high schools.
- ▶ Is comprehensive and easy to implement in class.
- ▶ Provides a valuable, reliable, and realistic learning environment at a reasonable price (or opportunity cost) to students and teachers who are interested to learn more about economics, apply economic analysis, or test a strategy/theory.

# How do I teach economics using a simulation game to improve learning?

- ▶ Determine the learning objectives of the game. Select a simulation game that teaches or reinforces one or more specific topics in the class.
  - ▶ Simple and short games are excellent to reinforce single topics like price elasticity.
  - ▶ Complex and longer running games are excellent as an integrative tool to bring many concepts together or to demonstrate long-run analysis, like the Stock Market Game.
- ▶ Decide on individual or group work. This depends on the objectives and complexity of the exercise.
  - ▶ Group work ( 2-4 people) provides the benefit of sharing knowledge and promoting teamwork. The more complex the simulation game, the greater are the advantages of group work by taking advantage of the diversity of student knowledge and the use of division of labor.
  - ▶ Individual work avoids the free-rider problem.
- ▶ Assign relevant supplemental readings that help explain the technical details of the game. These can be assigned the day before or done at the beginning of class.
- ▶ Always finish with a debrief that connects lessons from the simulation game to the larger content.

# Simulation #1:

## Diminishing Marginal Utility

- ▶ Source: Marginal Analysis (NCEE Capstone 1993) AKA the Donut Game; Or Popcorn and Soda-pop (Favorite Ways to Learn Economics 2002)
- ▶ Start with vocabulary:
- ▶ **Utility:** The abstract measure of satisfaction or happiness that a consumer receives from a bundle of goods.
  - ▶ *Economists say:* A consumer prefers one bundle of goods to another if the first provides more utility than the second does.
- ▶ **Total Utility:** the sum of all the utility we obtain when we consume a series of a good.
- ▶ **Marginal utility** = the increase in utility that the consumer gets from an additional unit of that good.
- ▶ Most goods have a **diminishing marginal utility** = the more of the good the consumer already has, the lower the marginal utility provided by an extra unit of that good.



# Track your player

**Diminishing Marginal Utility:** Evaluate the utility gained from each new unit: 0 to 10 where 10 is *highest satisfaction*

Qty	Total Utility (P1)	Marginal Utility (P1)	Total Utility (P2)	Marginal Utility (P2)
1				
2				
3				
4				
5				
6				
7				
8				
9				
10				
11				

# My students this year

**Diminishing Marginal Utility:** Evaluate the utility gained from each new unit: 0 to 10 where 10 is *highest satisfaction*

Qty	Total Utility (P1)	Marginal Utility (P: Jake)	Total Utility (P2)	Marginal Utility (P: Ellie)
1	9	9	9	9
2	16	7	18	9
3	25	9	24	6
4	33	8	29	5
5	38	5	32	3
6	43	5	34	2
7	47	4	35	1
8	49	2	36	1
9	50	1	36	0
10	51	1		
11	51	0		

# Simulation #1: Lessons for Diminishing Marginal Utility

- ▶ As you consume more and more of a good, your marginal utility decreases.
- ▶ As your marginal utility decreases, you become less interested in consuming another unit of the good.
- ▶ When MU falls below MC, you will decide to stop consuming more units of this good
- ▶ The law of diminishing marginal utility: The marginal utility from consuming equal units of a good eventually declines as the amount consumed increases.
- ▶ Next Steps in Class:
  - ▶ Graphing MU and TU
  - ▶ Understanding MU/P
  - ▶ Practice AP Problems



# Simulation #2:

## Econ-medy Club

- ▶ Source: Externality Experiment: The Economedy Club (Favorite Ways to Learn Economics 2002)
- ▶ Start with vocabulary:
- ▶ **Externalities:** the uncompensated impact of one person's actions on the well-being of a bystander; when a transaction between a buyer and seller directly affects a third party
  - ▶ Externalities are an important source of **market failure** that we experience every day, although we may not be aware of it.
  - ▶ **Positive vs. Negative Exaternalities**
- ▶ Great Videos:
  - ▶ [Externality Video](#) (Learn Liberty)
  - ▶ [The Sillier version](#) (yadayadaecon)
- ▶ This activity provides insight into externalities & allows students to feel and graph private and social costs, identify utility-maximizing and socially optimal consumption levels, and prescribe appropriate remedies.



# Econ-medy Club Scenario

- ▶ This experiment involves three independent producers of human capital - the memorizers - and two joint consumers of humor - the comedians. The comedians will be seated on opposite sides of the room, with the memorizers seated in the middle. The memorizers' goal is to memorize as many consecutive words in a text as they can in 30 seconds. The hypothetical payoff for the human capital the memorizers attain (think the ability to score well on an exam or impress people with your knowledge of history, economics or even sports) is worth \$3 per word memorized.
- ▶ In case you are selected as a memorizer, try memorizing the paragraph on your paper for the next 30 seconds.

Joke	Marginal Utility (In Dollars)
1	10
2	9
3	8
4	7
5	6
6	5
7	4
8	3
9	2
10	1

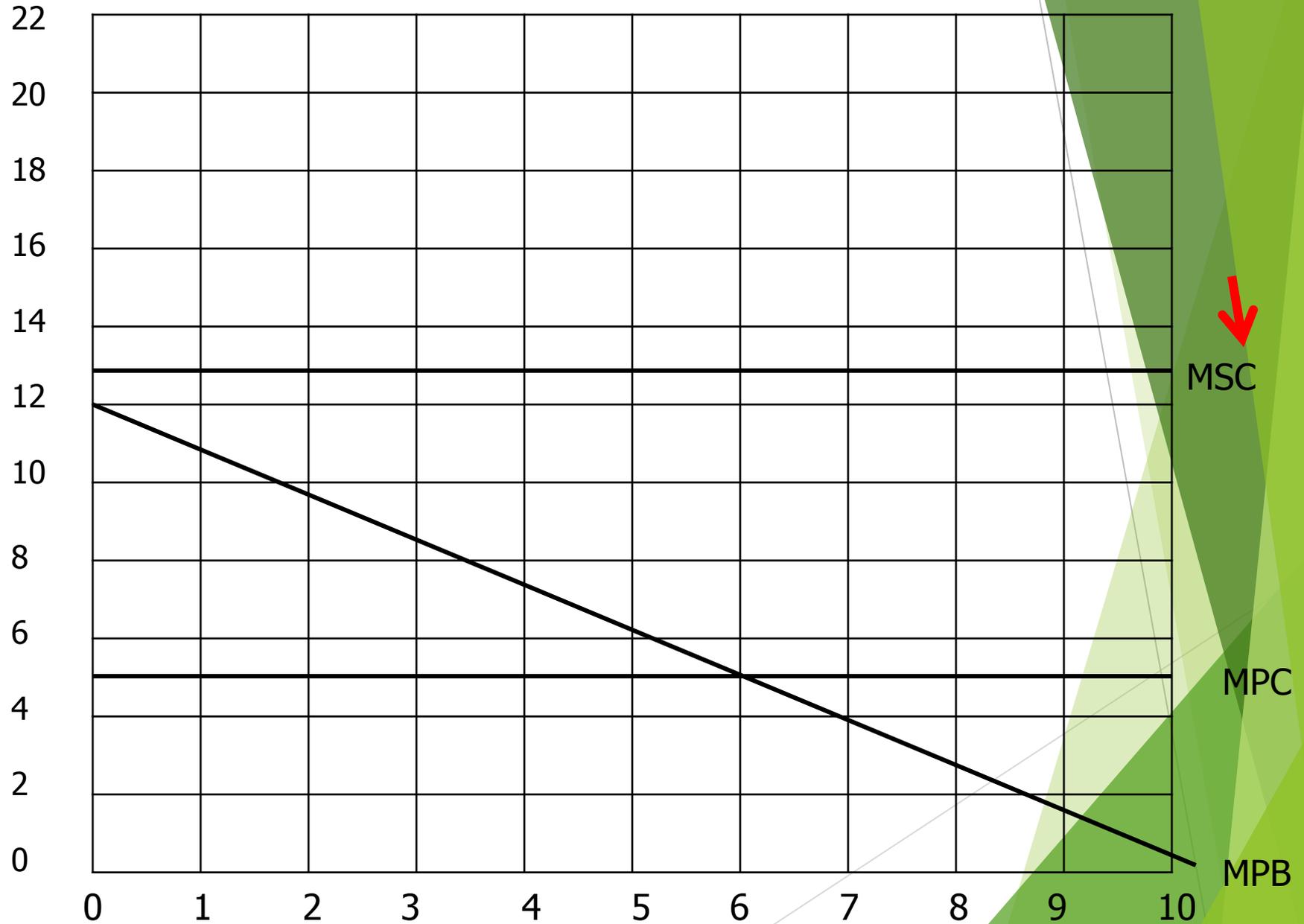
My class last year

Memorizer	# of Words	X \$3	Total Earned
Cory	14	X \$3	42
Lily	25	X \$3	75
Mike	35	X \$3	105

# My class last year

Memorizer	# of Words	X \$3	Total Earned	Comedi ans (2)	Total # of Jokes	Total Utility
Cory	12	X \$3	36	Tom & Vitaly	5	40
Lily  (Use middle kid for graphing)	12	X \$3	36			
Mike	10	X \$3	30			

# Econ-meddy Club Graph: Lily



# Simulation #3: Econ-med Club

- ▶ Externalities are a part of many transactions in life.
- ▶ People often don't take into account the impact of their decisions on other people.
  - ▶ Should government get involved?
- ▶ Next Steps in Class:
  - ▶ Externality Research and presentations: smoking, car emissions, education, Monsanto, smart phone usage, etc. (student selected)
  - ▶ Practice AP Problems
  - ▶ Externalities and DWL
  - ▶ How should we regulate goods with negative externalities?



# Simulation #3: Tragedy of the Commons

- ▶ Source: Tragedy of the Commons Game (Favorite Ways to Learn Economics 2002)
- ▶ Start with vocabulary:
- ▶ **Private Goods:** Traded through voluntary exchange
  - ▶ People who are not part of the transaction can be excluded from it
  - ▶ Pure private goods can also not be shared (haircut)
- ▶ **Public Goods:** Offered by the public sector (federal, state, or local governments)
  - ▶ People cannot be excluded from use of the good
  - ▶ Must be able to share the good
- ▶ **Free rider problem:** using a shared resource without contributing
  - ▶ What happens if you don't contribute to MPT or NPR?



# Public v. Private: Fishing for Goldfish



- ▶ Round 1:

You will get 1 reward for each goldfish you “catch”

- ▶ Round 2:

You will get 2 rewards for each goldfish you “catch”

# Debriefing the goldfish

- ▶ Tragedy of the Commons: common resources get used more than is desirable from the standpoint of society as a whole.
- ▶ How is this evident?
- ▶ What is the role of property rights?



# Simulation #4: Exchange Rates

- ▶ Source: Exchange Rates: Money around the World (Economics in Action: 14 Greatest Hits for Teaching High School Economics 2003)
- ▶ Start with vocabulary or a little humor:
- ▶ **Exchange Rates:** The price of a nation's currency in terms of another currency.
- ▶ **Determinants that Impact Appreciation and Depreciation:**
  - ▶ Consumer Tastes, Relative Incomes, Relative Inflation, Speculation, Interest Rates, and Supply of products.



Currencies  
from  
around  
the  
world

# Simulation #4: Exchange Rates

- ▶ There are now two counties: Goldlandia & The Land of Stars
- ▶ Citizens of these countries are currently not permitted to trade.
- ▶ Goldlandia uses macaroni for money and The Land of Stars uses black beans.
- ▶ You will receive the income you earned during the past year & it can be used to purchase goods/services produced in your country.
  - ▶ **Goods for Goldlandia:** Amazing Pencil, Golden chocolates, Pen, and Play dough
  - ▶ **Goods for The Land of Stars:** Amazing Pencil, Pull Back Car, Slime, and Starbursts.
- ▶ Each country has an appointed leader. The job of the leaders is to auction off to the highest bidders the three valuable goods for macaroni in Goldlandia and beans in The Land of Stars. Leaders will not take part in the auctions themselves, but we receive a small wage from the nation.
- ▶ Students who do not get one of the three more valuable items will exchange their income for the small candy or peanuts. Students may not save their bean or macaroni income.

# Simulation #4: Exchange Rates

Goldlandia		The Land of Stars	
Amazing Pencil		Amazing Pencil	
Pen		Pull Back Car	
Play dough		Slime	

- ▶ What is the cost difference for pencils in both countries?
- ▶ Why are bean prices were higher in general than macaroni prices?
- ▶ Are the people in The Land of Stars richer than people in Goldlandia because there were more beans than macaroni?

# Simulation #4: Exchange Rates

- ▶ A year has passed and many things have not changed. The leaders are still in power, the goods produced in each country are the same. Goldlandia still uses macaroni money and The Land of Stars still uses bean money.
- ▶ New Rule: The governments of the two countries now permit people in one country to buy goods in the other country. If you want to buy something from the foreign country, you must first have their currency.
  - ▶ Before the auction starts you have 3 minutes to exchange beans and macaroni if you wish to do so. There is no fixed rate for exchange and no one has to exchange currency if they don't want to. If you exchange currency, then you must report the completed transaction amount.

Beans	Macaroni
Ex. 7	3

# Simulation #4: Exchange Rates

Goldlandia		The Land of Stars	
Amazing Pencil		Amazing Pencil	
Pen		Pull Back Car	
Play dough		Slime	

- ▶ What is the cost difference for pencils in both countries?
- ▶ Were bean prices higher in general than macaroni prices?
- ▶ How did the rules in Auction two impact the economy?

# Simulation #4: Exchange Rates Auction



- ▶ Even when we have students who have traveled in other countries or who come from other countries, they likely have not thought about the issues underlying exchange rates and their fluctuations.
- ▶ An important lesson in economics is understanding that forces of supply and demand affect the value of major currencies, which, in turn, affects prices of goods and services and trade among nations.
- ▶ What is the impact when a nation with a “flexible” exchange rate intervenes and manages the exchange? (China)
- ▶ Next Steps in Class:
  - ▶ Calculating exchange rates
  - ▶ Graphing Exchange Rates
  - ▶ Practice AP Problems

# Questions?

