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## I, ROSE

### *Lecture Plan*

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### 1. LECTURE OBJECTIVE

Introduce students to the price system: how markets connect to one another and form a sophisticated global network that is constantly adjusting based on price signals. This lecture uses a Valentine’s Day analogy to illustrate key points.

### 2. PRE-CLASS ASSIGNMENT

Students should watch the following videos before class:

**Video:** [I, Rose](#) | Marginal Revolution University | [Principles of Microeconomics course](#)

**Video:** [The Great Economic Problem](#) | Marginal Revolution University | [Principles of Microeconomics course](#)

**Video:** [Markets Link the World](#) | Marginal Revolution University | [Principles of Microeconomics course](#)

**Video:** [A Price is a Signal Wrapped up in an Incentive](#) | Marginal Revolution University | [Principles of Microeconomics course](#)

### 3. LECTURE PLAN

#### INTRO

*I, Rose and Markets Link the World*

The goal of the first video, [I, Rose](#) (The title comes from [Leonard Read’s 1958 essay “I, Pencil”](#)) is to open students’ eyes to the mind-boggling complexity of a modern economy. Other examples can also be used to illustrate the same idea in the classroom: Ask students to think about how many products from how many countries are easily available at a supermarket (show a well-stocked supermarket aisle). Or consider an Apple iPhone which is produced by suppliers from all over the world—including many from China but also Italy, Japan, the Czech Republic, Korea, Germany, France and from across the United States. We found a supplier, for example, in Manassas, VA close to where we work and you may find one close to your location as well. (See [Apple’s supplier list](#)). [NPR’s Planet Money podcast episode](#) on the logistical miracle of getting roses to an NYC flower shop in time for Valentine’s Day provides a nice complement to the [I, Rose](#) video.

Starbucks offers another simple but effective example. Try searching online for “Starbucks supply chain” and also look for the [infographic showing the places in the world](#) where Starbucks buys its coffee, sugar, and paper.

Challenge students to take a simple product and trace its origins as far as they can noting that each supplier itself has suppliers and so do each of the suppliers' suppliers!

Another good way to drive home this point is to have students imagine having to create everything they consume and use on their own. I, [Chicken Sandwich](#) (3 minute video) provides a great example. A six-inch chicken sandwich at Subway costs roughly \$4.25. A person working a minimum wage job can trade a little over 30 minutes of work for such a sandwich that allegedly cost \$1500 to make from scratch. Thus, prices tell us that we should probably spend our time working at a different job and use the earnings to buy a chicken sandwich rather than make it from scratch.

The [Markets Link the World](#) video provides a slightly different lens of the same miracle: it's amazing how much cooperation the world exhibits through trade. Discuss how much trade and cooperation must occur to produce just one sandwich. Remind students that every supplier employs potentially thousands of different people and so each product is made by hundreds (if not more) people. Stress how many jobs/people are responsible for one product multiplied across the thousands of products we own. In essence, the price system allows each of us to coordinate and trade with millions of people over the course of our lifetime. This is akin to the six degrees of separation concept. (If students are not familiar with the concept, see Barnett, Emma (22 November 2011): "[Facebook cuts six degrees of separation to four](#)," The Telegraph.). Is there such a thing as six degrees of consumptive separation? Perhaps invisible hand cooperation connects us in fewer links than our more deliberate social links. Discuss.

#### OPTIONAL

Discuss the inventions that spring up to simplify this miraculous coordination process (e.g., shipping container and pallet). NPR's Planet Money podcast has an interesting podcast [episode](#) on the tension of switching from one pallet format to another.

#### OPTIONAL

Briefly mentioned in the video is Aalsmeer – the town in the Netherlands that hosts the world's largest flower market. An excellent article and video can be found at The New York Times (search at NYTimes.com for "Aalsmeer" see the [Dec 16, 2014 article](#)). Further discussion could examine the economics of Dutch auctions, middlemen and how the Internet is changing commerce.

#### *A Price is a Signal Wrapped up in an Incentive and The Great Economic Problem*

The complexity of the world economy is amazing and it's even more amazing when we realize that the intricate global coordination of markets and people is constantly changing.

[A Price is a Signal Wrapped up in an Incentive](#) starts by looking at how the flower industry moved offshore in response to the increase in the price of oil in the 1970s. The goal here is to show that competition is a discovery procedure. The increase in the price of oil signaled to entrepreneurs that it would be profitable to cut back on their use of oil but the myriad ways in which this was done could never have been predicted or planned. First, entrepreneurial inspiration is equally as unpredictable as scientific or artistic inspiration. Second, the information that is necessary to respond to change is not and could not be centrally collected, rather it is dispersed. Thus, to respond to change we must give individuals the information and the incentives that they need to use their entrepreneurial insight and localized knowledge to move in the right direction. Prices convey both information and incentives, hence the title of the video!

Emphasize the intricacy of the global economy by showing students a series of seemingly disparate items that share a common input of production and are thus directly affected by a change in that commodity's price. The video used jet fuel and flowers both sharing petroleum as a common input. As an example, show students pictures of the following items: lipstick, tires, Splenda, and diapers and ask them to guess what input they have in common. (Answer: corn) Changes in the price of corn will force firms to become more creative about their

use of corn in these and many other products. [The Great Economic Problem](#) video connects oil prices to candy bar prices through a more subtle substitution effect.

Note: students are usually pretty bored when their economics teachers talk about oil (I know I was!). It might be helpful to have a very concrete discussion about how important oil is for virtually everything, not only as a direct input, energy source, or substitute for other raw materials, but also as an indirect input as a transportation enabler. The videos provided some good examples such as showing the relationship between oil and candy bars, and oil and asphalt. The following provides a nice list of some of the many different products containing petroleum: <http://www.ranken-energy.com/products%20from%20petroleum.htm>.

#### GROUP EXERCISE:

Students will need at least one laptop per group to complete the assignment. This assignment will likely be started in class and completed at home.

Have students perform a similar exercise in groups of two to four: assign each group a raw material, such as petroleum, that is a common input for a wide range of very different end products. (More than one group can have the same raw material.) Other possible items are corn, wood, wheat, and rice. Students then research and identify three to four very different end products in class, preferably products they own or use regularly, that share this raw material as an input. Either in class or at home, students then create a collage of the items by posting them to Instagram using one common hashtag. Share the best ones at the end of class or the next class. Highlight how a change in the price of one raw material affects prices of thousands of goods through direct and indirect channels. Ideally, by selecting items that students commonly use or own, they will see how all of this directly affects their own lives and their own incentives as consumers, much like lovers switching from flowers to chocolates and teddy bears as Valentine's Day gifts as mentioned in the video, in addition to affecting firms' and entrepreneurs' decisions. Discuss.

#### OPTIONAL:

Advanced students may be directed to read Friedrich Hayek's [Use of Knowledge in Society](#), a deep yet accessible paper that first made many of these ideas clear.

#### OPTIONAL:

Further discussion can go in several directions. One may wish to compare, for example, the price system with central planning: How do the two systems try to solve the problem of information and incentives? What are some of the benefits of the market system? What are some of the benefits of central planning?

#### OPTIONAL:

Another direction is to delve deeper into how prices contain information. In recent years, for example, markets have been designed to elicit information about future events. [The Iowa Electronic Markets](#), for example, use markets to predict elections. Students are often intrigued to discover that it's quite easy for them to trade in these markets. Over nearly 20 years the Iowa prediction markets have been more accurate and timely in predicting elections than have polls. Why are market predictions more accurate than polls? Which other future events could markets be used to predict (see the [Hollywood Stock Exchange](#) for one example)? How do prediction markets illustrate the information role of prices? Modern Principles of Economics discusses many of these ideas at greater length. For more, see MRU's [Prediction Markets](#) video.

## 4. POST-CLASS ASSIGNMENTS

**Students:** Have students create and Instagram their best visual depiction of the concept “a price is a signal wrapped in an incentive.” Share best examples in a future class.

**Teacher:** Create one additional collage by compiling four items that share one surprising input. One example would be paint, makeup, jeans, and margarine. Ideally, you would take pictures from your own home rather than online photos. Instagram it using a unique hashtag you share with your students, and give extra credit to any student who identifies the raw material they share. (Answer: cotton)

Reflect on the class discussion and student exercises. When were students most engaged? Confused? Bored? What could you do to change/improve the discussion?

## 5. SUPPLEMENTAL RESOURCES

**Textbook:** Any principles of economics textbook. The videos are based on The Price System: Signals, Speculation and Prediction in [Modern Principles of Economics](#) by Tyler Cowen and Alex Tabarrok but are appropriate for use by any teacher using any textbook.

**Video:** [Prediction Markets](#) | Marginal Revolution University | [Principles of Microeconomics course](#)

**Podcasts:** NPR’s Planet Money: [Episode 603: A Rose on Any Other Day](#), [Episode 545: The Blue Pallet](#)

**Articles/books:** Friedrich Hayek’s [Use of Knowledge in Society](#), Leonard Read’s 1958 essay “[I, Pencil](#)”, Backstrom, Lars, et al. “[Four degrees of separation.](#)” [Proceedings of the 4th Annual ACM Web Science Conference. ACM, 2012](#), Abdullah Al-Bahrani, Darshak Patel, Brandon Sheridan, Engaging students using social media: The students’ perspective, [International Review of Economics Education](#), Volume 19, May 2015, Pages 36-50

**News:** Barnett, Emma (22 November 2011). “Facebook cuts six degrees of separation to four”. [Telegraph 18 Surprising things made with Corn, Products Made from Cotton](#)

## 6. FAST FACTS

- Approximately one billion flowers will be delivered in the United States over the Valentine’s Day season.
- 850 million flowers are imported for Valentine’s Day, primarily from Colombia and Ecuador but also from the Netherlands, Kenya, Thailand and elsewhere.
- More than five billion flowers are imported annually.
- On average, more than 21 million flowers are auctioned off for global distribution in Aalsmeer, Holland every day.
- There are approximately 17,000 florists across the United States.