Economics Undergraduate Board
UNIVERSITY OF WASHINGTON

# THE ECONOMIZER

VOLUME 19, NUMBER 1 DEPARTMENT OF ECONOMICS AUTUMN 2009

## The Monty Hall Problem

*By Zilai Li*

The Monty Hall problem comes from the American TV show Let's Make a Deal and is one of the most famous problems in the field of game theory.

Suppose you are on a game show and there are three doors in front of you. There is a car behind one door and there are goats behind the other two. Strangely enough, you prefer winning a car instead of goats. When the game starts, you are given the choice to open a door and you will win whatever prize you find behind that door. The host, Monty Hall (hence the name of the problem), is the only person who knows behind which door is the car. After you pick (but not open) your door, the host opens one of the other two doors and reveals a goat. He then offers you the option to switch from your original choice to the remaining unopened door. Do you want to keep your pick or do you want to switch to the other unopened door?

*Answer on Page 3*

## Federal Government Opportunities for Graduating Seniors

*By Karina Kats*

Government jobs are not often sought after by college graduates as most students are eager to attain a career at a prominent company in the private sector. There are many reasons that encourage students to follow this path; one in particular is the strong driving force of a possibly higher income associated with private sector jobs. While this may be true at times, during economic turmoil it is not often the case. Currently, an inordinate amount of people are being forced to take lower paying jobs for which they once received much higher pay. Not only has the salary become less desirable but the ability to find a job out of college has become more difficult.

In the midst of the current economic crisis, one sector in particular has seen moderate growth. The government sector has expanded to compensate for the shrinking of the public market. Aid from grants and stimulus funding has also helped this sector develop the need for need for new employees. These factors are leading government agencies to look to recent college graduates to fill employment positions.

Students cannot forget that there are many positive aspects to working for the government. There is a lot of potential for growth within career fields, starting with internship programs for students who have recently graduated or are still attending college. Programs can take place over a few months, or multiple years, and include on the job training, educational courses pertinent to the career field, mentorships and the option to travel. These programs develop individuals into well-rounded specialists in their particular field. They also prepare employees for a wide range of future jobs as government careers often encompass numerous areas of expertise. Once individuals have mastered the internship phase, there are many more opportunities available to them as fulltime employees for a government agency. These include leadership trainings, sabbatical programs funding further education, and the endless possibility for career advancement.

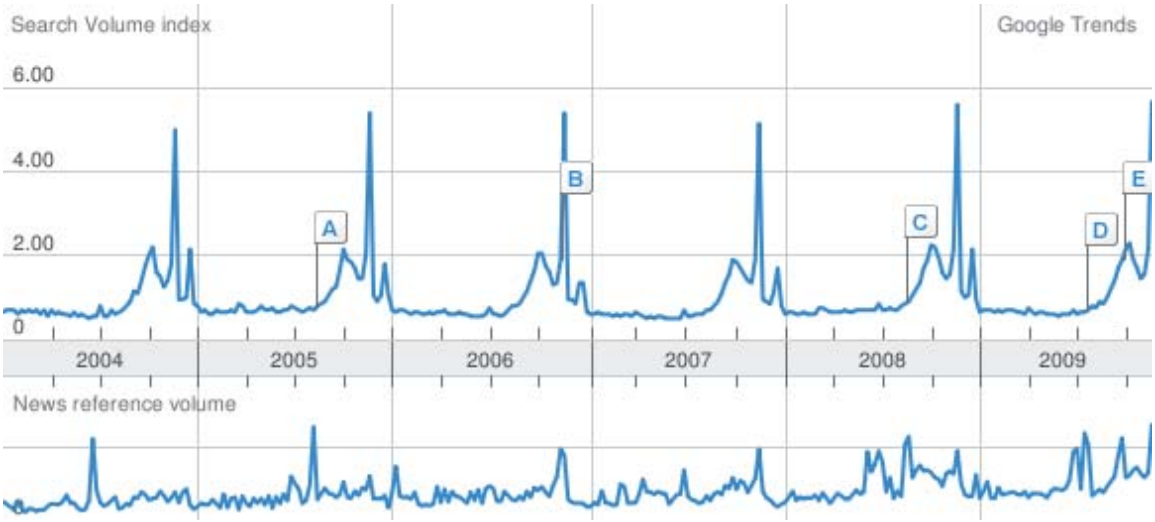
There is always potential for growth and the employee benefits associated with federal careers are vast and provide great stability. This may not be a priority for graduating students but it will become very important later in life. There are many advantages to government careers in today's economy and this sector should not be overlooked by graduating seniors.

# How Often is Apple Pie Delicious?

*By James McQueen*

In economics and a number of other social and physical sciences we often have to examine data that occurs over a period of time. Ironically enough, we call this time series data analysis. There are a plethora of examples of time series data in economics: inflation rates, GDP, stock prices, etc. Certain time series data sets appear to be increasing over time or decreasing, regardless, we call this the data's trend. Other data sets remain constant but fluctuate around a mean (the average value of the data). Most often in economic data both present. With time series data, we are often interested in forecasting—predicting the future based on information in the past. Sure it sounds a lot like voodoo economic mumbo jumbo but there's some truth behind it as data often follows a relatively predicable pattern.

One of the prime examples of predictable fluctuations from the trend is called seasonality. That is, when something varies season by season. In econometrics, seasons don't necessarily have to be the four seasons as we think of them: Spring, Summer, Autumn, Winter. Seasons can be quarters or months or even weeks—basically, any pattern that repeats itself every year. What's an example of something that is seasonal? Let me introduce you to Google Trends, one of the most fascinating tools available. The website is: http://www.google.com/trends. If you go to this website and type in, for example, "apple pie" you will get the intriguing graph below.




*Demand for apple pie for 2004-2009, peaking during winter (holiday) months.*

Looks pretty interesting doesn't it? What you're looking at is the searches (don't worry too much about the units, they're scaled) for the term "apple pie" from 2004 until now. What are those weird spikes? Well those spikes are: September, November, and December. Why, you ask? Well September is the beginning of apple season so naturally people are looking up what to do with all the new and cheap apples. November, as I'm sure is fresh in everyone's memory, is Thanksgiving (hence the massive spike in searches for apple pie as everyone rushes to learn how to cook the American staple). Finally, December, when people often eat apple pie during Christmas too.

If what we're looking at seems as predictable as it appears to be then we might be able to, predict similar trends in the future. Now apple pie might not seem as interesting to you as I assure you it seems to me but bear with me for this particularly humorous example.

*Continued on Page 4*

## Monty Hall Problem: Answer...

*Continued from Page 1*

The best strategy is to switch to the other unopened door. Initially, since you have no information about which door hides the car, every outcome is equally likely to happen. When you first choose a door, you have 1/3 chance to get the car and 2/3 chance to get the goats. Let's label the doors as A, B and C, and suppose the car is behind door A. If you keep your initial choice, then clearly you only have 1/3 chance to get the car. If you switch your choice, however, there will be three possible outcomes:

1. You initially choose door A, then you will lose by switching your choice.
2. You initially choose door B and the host opens door C, then you will win the car by switching.
3. You initially choose door C and the host opens door B, then you will win the car by switching.

Since all the above outcomes are equally likely to happen, by switching your choice, the probability of winning the car is 2/3 instead of 1/3. Therefore, you should always switch your choice.

## "Tired" of Trade?

*By Sydnie Kang*

If you have been a loyal reader of any major economic/business journal, you would be able to recognize "Chinese tires" as a key word in recent dispute. The U.S. government proposed a 35% tariff on imported Chinese tires due to a complaint filed by industry union members declaring unfair trade. They claim that cheap Chinese tires have stolen the tire market as well as job opportunities from the U.S. Consumers may soon be surprised to find that low-end, tires labeled 'Made-in-China' are no longer cheap, forcing them to switch to American tires at almost double the price.

The intuition behind this tariff is that American customers might have to suffer a little from the soaring price, in order to contribute to the recovery of the U.S. economy and benefit hardworking domestic laborers. Consequently, China will be penalized for playing the game 'unfairly' at the advantage of its cheap labor. This is a typical, nationalist emotion that is common among U.S. citizens; but you, the reader of the Economizer, should know that this conclusion is completely irrational, judging by the Ricardian principle of comparative advantage.

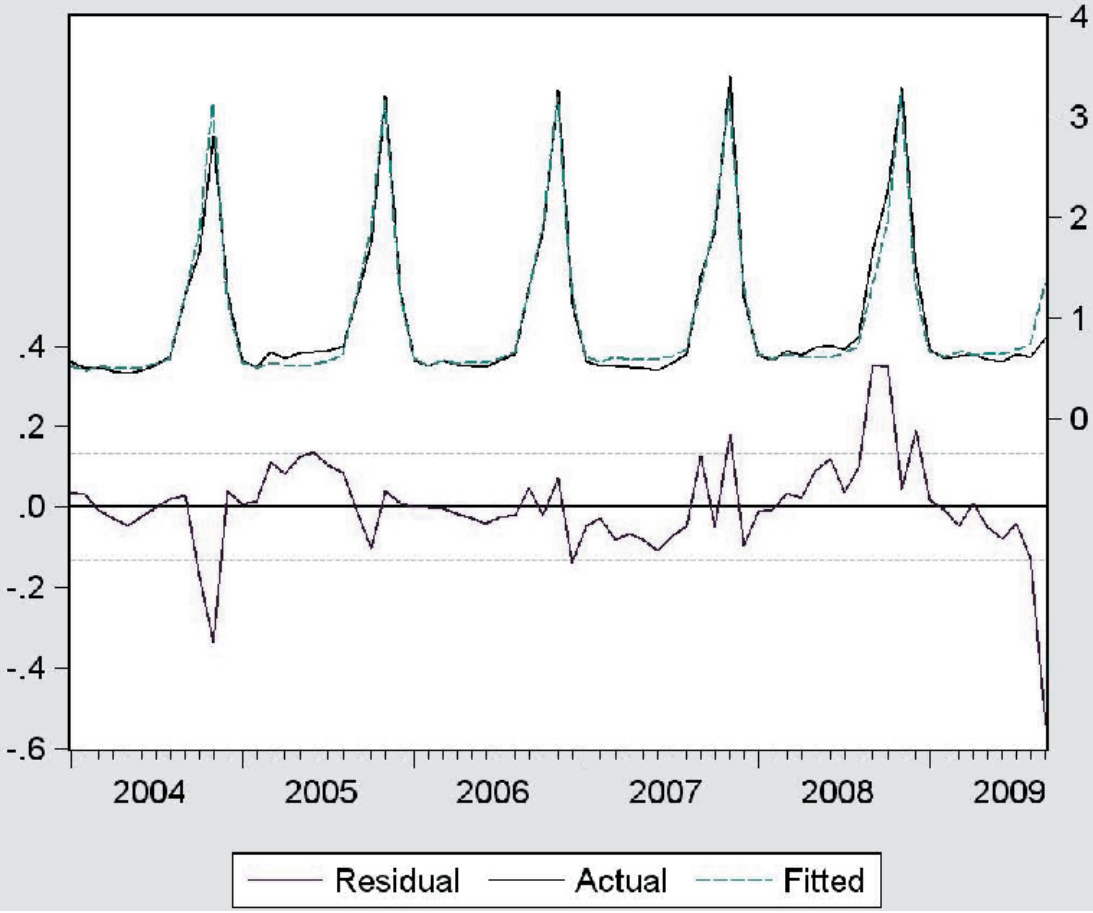
Primarily, in the case of tire production, China is not producing a defective or poisonous product; their tires are low in cost to satisfy the need of lower class and economy vehicles. We can now establish a model with two countries: China and the U.S., producing two kinds of goods: low-end tires and high-end tires. It is rational to assume that the U.S. has absolute advantage in both goods because of its technology and educated-labor. But economists should only focus on comparative advantages. The U.S. might be able to make more of both tires with a specific number of labor hours, but the opportunity cost of making a low-end tire is too high. China, however, has comparative advantage in making low-end tires. By specialization and free trade, the two countries should be able to, ideally, maximize their output. Yet no intermediary is present to distribute the output, so the market made its decision: preference towards cheap tires.

In the Stolper-Samuelson model we see that trade liberalization would reduce the real wages of the scarce factor and increase those of the abundant factor. If this theory can be applied in our model, we would expect to see Chinese laborers on assembly lines and American capitalists gain from trade. Consumers are able to substitute expensive made-in-USA tires with cheap Chinese tires and save a notable amount of money. Yet the tire industry union members, who are the scarce factor of production in the U.S., would be worse off. Although their loss is incomparable to what the whole society has gained through trade, their reaction is the fiercest and their voices are the loudest. Thus it is no surprise that the tariff against Chinese tires is well supported by the public who, in fact, have benefited from trade for years.

# How Often is Apple Pie Delicious? Continued...

*By James McQueen*

Economists have some pretty handy tools when it comes to modeling things like Seasonality. One tool many of you might be familiar with is called EViews. Without getting into the technical details, with the help of mathematics and statistics, we are able to write an equation that, when given the time, will produce an estimate for (in this case) the amount of searches for apple pie. What you will see below is a graph of that equation paired with the original data set.




The black solid line is the graph of the data and the grey dashed line is the fitted line (the black line at the bottom represents the residuals.); it doesn't look too bad. It's not a perfect model and if you take Economics 482 or 483 you will see there are other things that can and should be done to make a more accurate model, however, given that all I did was add what are called "seasonal dummies" to the data it's pretty accurate. What this all means is now, given that I know the value of time in the future, I can predict or forecast the number of searches for apple pie for any time in the future. These results do not sound too exhillerating in the example of apple pie, but when translated to other issues with time series data, the ability to predict the future is quite revered.

The Economizer is a quarterly newsletter published in the Department of Economics by the EUB. The articles herein do not necessarily reflect the views of the department or its faculty.
EDITORS: Mary LaBissoniere, James McQueen.
WRITERS: Zilai Li, Karina Kats, James McQueen, Sydnie Kang.
Questions, Comments, Concerns?
EMAIL: eub@u.washington.edu

**Visit EUB on the Web: http://depts.washington.edu/ecnboard**