

Player Evaluation Assignment, ECO 579, Darren Grant, Fall 2010.

This assignment is due at the beginning of class on Thursday, Sept. 16. Written material should be typed, 12 pt. font, double spaced, and the whole assignment stapled together. Please do not ask me to accept assignments that are not stapled, and please do not exceed the space limit of three written pages of text—my grading will stop there. (Copies of your spreadsheet and graphs do not count in the three page limit.)

As indicated on the course syllabus, on this and all other assignments, all work is to be strictly your own. You are welcome to contact classmates to clarify the requirements (i.e., what the assignment is asking), but on all substantive matters please direct your questions to me.

In this assignment we will assess the value of Major League Baseball (MLB) non-pitcher free agents signed for the 2010 season, using a simplified version of the methods described in the article “An Economic Evaluation of the Moneyball Hypothesis.” Six web sites will be of use in doing so:

- Player Salary Database: <http://content.usatoday.com/sports/baseball/salaries/default.aspx>
- Player Performance Database: <http://www.baseball-almanac.com/players/ballplayer.shtml>
- Team Batting Statistics: http://espn.go.com/mlb/stats/team/_/stat/batting/year/2009
- Team Attendance Statistics: http://espn.go.com/mlb/attendance/_/year/2009
- Team Standings: http://espn.go.com/mlb/standings/_/year/2009
- Team Average Ticket Prices (for 2009 season): <http://teammarketing.com/fancost/mlb/>

Here is what to do:

Team Sheet:

The first sheet will relate the team’s batting effectiveness to winning percentage and revenue.

1. Obtain team OBP and SLG from the team batting database above, along with team attendance, winning percentage, and the average team ticket price, from the appropriate links.
2. Put the team name in the first column of the sheet, their winning percentage in the second column, OBP in the third column, SLG in the fourth, and leave the fifth column blank for now. Then put attendance in the sixth column, ticket price in the seventh column, and calculate total team ticket revenue and put that in the eighth column.
3. The “Economic Evaluation” article indicated that OBP was twice as important as SLG in producing runs and wins. Thus, create a simple “index” of offensive production, $100*[2*OBP + SLG]$, and put that in your fifth column. Multiplying by 100 just makes the numbers easier to read and interpret.
4. Create a scatterplot that relates the index you have just created, on the x-axis, to the team’s revenue, on the y-axis. Include the Excel trendline and display the equation of the trendline (this is an option in the chart design / layout tab). The slope of the trendline tells you how much each additional point of the index would be worth in revenue, in dollars. There is one “outlier” in your data. Delete this outlier and then use the coefficient estimate on the trendline as your estimate the value of increases in the index of team offensive production.

You need not do steps 5 and 6, but can if you want to break down the links more carefully.

5. Create a scatterplot that relates the index you have just created, on the x-axis, to the team’s winning percentage, on the y-axis. Include the Excel trendline and display the equation of the trendline (this

is an option in the chart design / layout tab). If the index increases by 1, how much does the team's winning percentage increase by?

6. Create another scatterplot of win percentage (x-axis) and revenue (y-axis), and include the Excel trendline and the equation, as before. If the team's winning percentage increases by 0.01, how much does the team's revenue increase by?

Player Sheet:

The second sheet of your spreadsheet will relate player batting to player salaries.

1. Go to the list of free agents at the back of this assignment and choose twenty players at random. (All pitchers should have been taken off the list.) Work out a process you will use to pick your players—it should be a random process—and use it to choose your twenty. Please describe this process in your write-up.
2. Obtain recent OBP and SLG for each player from the performance database above. You can just use the players' 2009 statistics if you wish, but you can also include data from earlier seasons as well if you wish. Do not use 2010 statistics—we are pretending this is just before the season began.
3. Obtain those players' 2010 salaries from the salary database.
4. Put the player name in the first column, their on-base percentage in the second column, their slugging percentage in the third column, and their 2009 salary in the fourth column.
5. In the fifth column, calculate the player's index of offensive production, just as you did above for the team. Then, calculate the player's "marginal product": the amount that they increase the *team's* offensive index, instead of a player at the "Mendoza Line" of a .250 OBP and .300 SLG. Recognizing that the average starter takes 1/10 of all of the team's at-bats, calculate the difference between each player's index and the index of the Mendoza Line player, and then divide this by ten.
6. Now, in the sixth column, put that player's MRP—the extra revenue the player brings in for the team. This is the product of player's marginal product and the value of increases in that marginal product, which you calculated on the previous sheet, plus the league minimum of \$400,000, for which we assume any team can get a player at the Mendoza Line.
7. Make a scatterplot of your salary prediction vs. players' actual salaries. How close are they?

Your Write Up:

Write out, in three double-spaced, typewritten pages, 1) what you did, including writing out any formulas you utilized in your spreadsheet; 2) why you did it, including an explanation and justification of the formulas you used; and 3) conclusions. To write out the formulas, you may use traditional algebraic notation or copy the Excel formulas out of your spreadsheet.

Attach a hard copy of your spreadsheet and graphs to your write-up, staple it together, and turn it in to me on Sept. 16. Please also keep a copy of everything for yourself, which you will use in class when we conduct a "mock player auction" for free-agents, and have "playoffs" between the teams you have "purchased"! Also, bring a copy of your spreadsheet file to class if you are interested in discussing the assignment that day—I will invite a couple of students to present their work to the class.

As with all assignments, you are invited to contact me by e-mail or phone with questions. Please get started early, that gives you time to work through any complications you may run into.

Teachers Assignment, ECO 579, Darren Grant, Fall 2010.

This assignment is due at the beginning of class on Thursday, Oct. 7. Written material should be typed, 12 pt. font, double spaced, and the whole assignment stapled together, including copies of all supporting material identified in #7 below. Please do not ask me to accept assignments that are not stapled, and please do not exceed the space limit of three written pages—my grading will stop there.

We will discuss this assignment in class, so on the due date please have computer-readable copies of your graphs available, either on a CD, flash drive, or via e-mail. You may be invited to show them to the class and describe them briefly. As with all assignments, this is to be independent work.

In this assignment we will analyze the market for schoolteachers, using data you collect yourself. Several web sites will be of use in doing so:

- Academic Excellence Indicator System: <http://www.tea.state.tx.us/perfreport/aeis/>
- Texas School District Maps: <http://deleon.tea.state.tx.us/SDL/Forms/>
- National Center for Educational Accountability: <http://www.just4kids.org/en/>
- Texas School Accountability Rating System (2009 version, to match the other data available): <http://www.tea.state.tx.us/perfreport/account/2009/index.html>
- Individual School District Web Sites (look up on google)
- *Journal of Human Resources* article by Hanushek, Kain, and Rivkin (attached)

Here is what to do:

1. Choose and obtain approval for a school district in Texas to study. The district must have at least twenty-five elementary schools that include the 5th grade, and should have some variation in socioeconomic status across schools. Use the Map site to look at districts, and Just4Kids to look at the percentage of low income students (who receive free or reduced lunch) in each school—this is our indicator of socioeconomic status (SES). Obtain approval from me—each student will study a different district. You will not need to study every school in your district, however. Just choose twenty-five elementaries, selected so that there is as much variation in SES as possible.
2. Obtain a copy of the teacher salary schedule from your district and at least four surrounding districts. These are generally available on the district's web site, but occasionally you will have to call and have them FAX it to you.
3. Read the JHR article, focusing on the main points and not getting bogged down in details.
4. Go to the AEIS and obtain, for each of the twenty-five schools you have chosen, the percent passing the 5th grade TAKS mathematics, the percent passing the 5th grade TAKS reading, the percentage of students on free or reduced lunch (which they call economically disadvantaged), the percentage of teachers in the school with five years of experience or less, and the average total operating expenditures per student (by function). Each of these numbers should be for 2009 (2008-2009 school year)—some, but not all, are available for 2010. Record these numbers in a nicely organized spreadsheet.
5. Create scatterplots of SES vs. math scores (% passing), SES vs. reading scores, SES vs. percent of teachers with less than 5 yrs. experience, and SES vs. average operating expenditures. Treat SES as the independent, or X, variable, and the others as dependent, or Y, variables.
6. Also create a graph of percent teachers with less than 5 yrs. experience vs. math scores, and another that replaces math scores with reading scores. Here, the percentage of inexperienced teachers is the

independent variable and the test scores are the dependent variable.

7. Write out brief answers to the following questions, no more than three typewritten pages maximum, staple the answers to a printout of your data, graphs, and salaries, and turn it in.

Here are the questions!

1. Competitiveness of Markets. First, compare salaries across districts. Do teacher salaries seem reasonably competitive across your market area? Why? Are they more competitive for beginning teachers or experienced teachers?
2. Labor Demand. Carefully examine the teacher salary schedule for your district. Describe the patterns that it contains. Theory suggests that the amount employers are willing to pay workers reflects their productivity. If so, what does the salary schedule indicate school districts do, and do not, value in teachers?
3. Labor Supply. Briefly summarize the JHR article. Then briefly summarize your graphs in #5 above. Do your graphs suggest that teacher supply follows the patterns described in the JHR article?
4. Equilibrium. Your teacher salary schedule has no compensating differentials of any kind. In this labor market, what does that mean?—what would it be like, instead, to have compensating differentials? Describe how the lack of compensating differentials affects the teacher supply patterns you described above. Does the lack of compensating differentials have any other repercussions in this market?
5. Output. Finally, let's look at performance, as measured by test scores. Based on your graphs in #6 above, are these scores related to the percentage of inexperienced teachers? Therefore, do the pay policies of school districts appear to influence student achievement in the schools you studied?

One or two paragraphs should suffice to answer each set of questions (1-5). Conclude your write-up with brief concluding remarks that focus on the big picture. Remember, your ultimate purpose is to learn how a market works and to understand the institutional features of that market.

CPS Data Analysis Assignment, ECO 579, Darren Grant, Fall 2010.

This assignment is due at the beginning of class on Thursday, Oct. 28. Please type all written material, 12 pt. font, double spaced, and staple the whole assignment together.

You are human resources director for large a nationwide company. The CEO, concerned about doing the right thing and adhering to civil rights law, asks you to look into whether your nonwhite and female employees are being paid comparable to their white, male counterparts. Using data on employee characteristics and wages from your records, you are to conduct an analysis to answer the CEO's question and suggest remedial action if warranted.

(The data you will be given is actual, recent data, but not from a particular company—it is from the Current Population Survey, a nationwide labor market survey that is conducted by the Census Bureau and managed by the Bureau of Labor Statistics. Each student in the class has different data. See <http://www.bls.gov/cps/tables.htm> for a survey of the information gathered using this survey.)

There are three general steps to the analysis. First, you will estimate a standard wage equation (using regression) to see if there is a “problem.” Second, you will run a standard wage equation just on white males, and “apply” the results to nonwhites and females. Third, you will re-estimate a standard wage equation on the wages that have been “revised” in the previous step, and see if the problem has gone away.

Specifically, here is what to do:

1. Your data contains all the variables you need. However, for your regressions you will need the squares of experience and job tenure, and the natural logarithm of wages. Create those columns in your spreadsheet. Be sure to put logged wages in the second column (actual wages are in the first column).
2. Run a wage equation regression using all of your explanatory variables, including the nonwhite and female dummies, and all of your observations. Interpret each of the coefficients. Are the coefficient signs consistent with human capital theory? Are the returns to schooling consistent with human capital theory? Is there evidence of discrimination? Answer each of these questions in your writeup.
3. Then, run a wage equation regression just for white males. You will need to sort your data to do this.
4. Now create two new columns in your spreadsheet—make it the third and fourth columns—that have “revised wages” and “revised log wages.” The revised log wages are equal to actual log wages for white males, and predicted log wages for everyone else, where the prediction comes from the regression in #3. Then “unlog” the numbers in column 4 to get those in column 3.

To “revise wages” as these columns suggest is your suggested solution to the discrimination “problem” (if you have one). Visually compare actual and revised wages. Is it going to be expensive to revise wages in this way? Can you see any problems with doing so?

5. Finally, run one last wage equation, again with all observations and all explanatory variables, in which the dependent variable is now “revised log wages.” Are the results still consistent with human capital theory? Is there still evidence of discrimination?
6. Write up your findings in the form of a memo to your CEO, no more than three typewritten pages maximum, attach this to a printout of the first page (only) of your data and printouts of your regression results, and turn it in. Keep your data and spreadsheet for at least a week afterwards—I reserve the right to ask to see your data and spreadsheet. Your write up should explain what you

did, why you did it, what you found, and answers to the questions posed above.

Note: The regression tool in Excel is an add-in. In the new version, you have to go to the big “Office” button, choose Excel options, and add in the “Analysis ToolPak.” Then you will find regression in the “Data Analysis Tools” available under the Data heading. It’s not hard to use once you find it.

For evidence of discrimination to be “statistically significant”—a standard that would be required in court—the appropriate t-statistic, which is given in your Excel regression results, must basically be greater than 2 in absolute value. Also, of course, the coefficient must take the sign that indicates discrimination is taking place.

Market Analysis, ECO 579, Darren Grant, Fall 2010.

This assignment is less structured than the others. You are to design a presentation describing how a particular labor market “works.” Over the course of the semester, we have become familiar with several labor markets and how they operate. Now it is your turn to add to our list! A hard copy of your slides, interview notes, and article is due at the beginning of class on Thursday, Dec. 9; be prepared to present on that day as well.

The guidelines are as follows:

1. You must create a PowerPoint presentation consisting of between eight and ten slides to present in class. The outline of your presentation is listed below.
2. In class, you will be given six to eight minutes to make your presentation. Questions may be asked, by me or your classmates, afterwards, as well, for a few minutes.
3. In the grading, completion of the assignment according to the instructions counts the most, followed by the content of your slides, followed by the quality of your verbal presentation.

Here is what to do:

1. Choose a labor market to analyze. The market need not be perfectly competitive, and can be related to your current job if you have one. You are welcome to discuss your choice with me, but I would prefer not to suggest markets to analyze—I would rather leave that up to you. The only markets ruled out are those we have already analyzed: professional sports, teaching, priests, drug dealing, and, of course, pirates. ☺

Please let me know the market you chose—if someone has already selected that market, I will ask you to choose a different market. This ensures variety in the class presentations.

2. Gather information about your market, based on personal experience, discussions with people who work or hire in that market, and/or readings. You should have a basic understanding of the institutional features of the market (Is it competitive? Are there unions? etc.), supply and demand (Is production labor intensive? Is there lots of turnover? etc.), and wages and employment.

There are three sources I want you to use in particular. The first is an “interview,” or discussion about your market, with at least one person who works in it, hopefully at the managerial level. The second is at least one good newspaper, magazine, or journal article of 1,000 words or more. The third, for basic wage, employment, and expected employment growth data, is the Bureau of Labor Statistics’ Occupational Outlook Handbook (OOH), <http://www.bls.gov/oco/>. (Look up the closest occupation if necessary.)

3. Prepare your PowerPoint presentation, as discussed below.
4. Practice your presentation. Public speaking skills are very valuable!
5. Give your presentation in class and turn in to me a hard copy of your slides, article, OOH printout, and interview notes, all stapled together.

Here is the way to structure your presentation:

1. Your presentation will have a narrative. I want you to identify a “problem” that your labor market has, and show how the market solves it, or how the firms in that market solve it.

For example, in our baseball discussion, one “problem” faced by Major League Baseball is how to finance the development of baseball skill when minor league teams are not financially viable on their own. This problem is solved by binding players to the Major League teams that draft them for their first six seasons in the majors, after which they can become free agents. These teams can underpay their players relative to their productivity, which creates a surplus that is used to offset losses on teams’ farm systems (the minor leagues).

Identify the problem in your title—now you have a hook to make your presentation interesting. For example: “FAST FOOD RESTAURANTS—HOW DO THEY MINIMIZE LABOR COSTS GIVEN RAPIDLY FLUCTUATING PRODUCT DEMAND?”

If you understand your market well, your narrative—the problem and the solution—will “spring to life” as it did in the many readings we have had this semester. While firms share certain basic labor market problems that they must solve, the details of the problem and of the solutions generally differ by market. Understanding these will help make your presentation distinct and meaningful.

2. After your title slide, present some basic facts about your market (as mentioned above). Describe, in simple terms, how this market functions. This can take two to four slides. If you can make a meaningful chart, graph, or table of basic information about your market, please do so.
3. Next, clearly describe the problem to be solved by your market. This should take one slide.
4. Next, describe the *main* way or ways your market / firms solve this problem. Do not present a laundry list—focus on the important stuff. There should be at least one link to the economic theory discussed in class in this part of your presentation, and one theory-related graph to illustrate this link. That is, show how the theory of labor economics helps us understand how this market / firm solves the problem you stated. This part of the presentation should take two to four slides.
5. Present a one-slide conclusion.

Your slides should list bullet points, or present a simple graph or table, but they should not be wordy—you augment the slides with your verbal discussion. Therefore, do not simply read your slides; instead, elaborate on the information given in the slides. You are welcome to prepare your talk on your own paper and read from it—that is not the same as reading your slides to the class. I am happy to review your PowerPoints by request, with at least 24 hours lead time. I will also give a “sample” presentation of my own in class, a couple of weeks before yours is due.