**Links to Estimation Techniques**

Tim Shaughnessy, Chapter 7 -- Demand Estimation and Forecasting, available from [*https://www.youtube.com/watch?v=daiTjsnznjM*](https://www.youtube.com/watch?v=daiTjsnznjM)

Matt Kermode, Explanation of Regression Results, Available at [*https://www.youtube.com/watch?v=c5blVUkkjTM*](https://www.youtube.com/watch?v=c5blVUkkjTM)

Jason Delaney, Introduction to Multiple Regression, Available at [*https://www.youtube.com/watch?v=eLpfEml4Vak*](https://www.youtube.com/watch?v=eLpfEml4Vak)

**Session Long Project**

**PART 1**

In 2006 the CEO of Bear Sterns, James Caynes, received a compensation package of $34 million. The following year Bear Sterns cost $2.7 billion to the taxpayers. In 2006, the CEO of Lehman Brothers received a compensation package of $27 million. On September 15, 2008, Lehman Brothers filed for bankruptcy. The collapse of Lehman Brothers is seen by many as the key event that sparked the Global Financial Crisis. In 2006, the CEO of Citigroup, Charles Prince, received a compensation package of $25 million. Since then the stock price has fallen from $50 a share to $3.5 a share. The CEO of Countrywide Financial, Angelo Mozilo, did even better. His compensation package was $43 million. Angelo Mozilo and two other top executives were charged by the Security and Exchange Commission (SEC) with fraud. According to the SEC, from 2005 through 2007, Countrywide Financial engaged in an unprecedented expansion of its underwriting guidelines and was writing riskier and riskier loans, which these senior executives were warned might ultimately curtail the company's ability to sell them. Countrywide Financial was the third biggest originator of subprime mortgages and the nation's leader in subprime mortgage- backed securities. The tragedy is that these individuals did not make decisions that were in their companies’ best interest. Why? What went wrong? What caused the relation between the CEO and the stockholders to go so badly awry? Discuss.

**PART 2**

An important component of this course is experience with analyzing economic data at the managerial level. The computer is a perfect tool for manipulating data and performing statistical analyses. While the focus of BUS 530 is not on learning statistics, this course will utilize and improve your computer skills with a computer assignment designed to illustrate the interconnections between data, information and managerial decisions.

The primary software will be Microsoft Excel and the Excel statistical add-in: **Data Analysis**. Microsoft Excel 2010 (and previous versions) provides a set of data analysis tools called **Analysis ToolPak** which you can use to save steps when you develop complex statistical analyses. You provide the data and parameters for each analysis; the tool uses the appropriate statistical macro functions and then displays the results in an output table. The Analysis ToolPak is a **Microsoft Office Excel**add-in program that is available when you install Microsoft Office or Excel. To use the Analysis ToolPak in Excel, however, you need to load it first. Click the **Microsoft Office Button**, and then click **Excel Options**. Click **Add-Ins**, and then in the **Manage** box, select **Excel Add-ins**. Click **Go**. In the **Add-Ins available** box, select the **Analysis ToolPak** check box, and then click **OK**. (If **Analysis ToolPak** is not listed in the **Add-Ins available** box, click **Browse** to locate it.) If you get prompted that the Analysis ToolPak is not currently installed on your computer, click **Yes** to install it. After you load the Analysis ToolPak, the **Data Analysis** command is available in the **Analysis** group on the **Data** tab.

In the Module 4 SLP assignment you are also asked to estimate a market demand or a cost function (your choice) using the tools of regression analysis and the regression software outlined above.

The estimation of demand follows two approaches:

* **the classical approach**, whereby the quantity demanded of a product is explained by its own price, the prices of related goods (complements and substitutes), income, tastes and preferences, and the size of the population, among others;
* **the hedonic approach**, whereby the price of an asset (car, house) is explained by the characteristics of the asset itself (i.e., the price of housing depends on the number of bedrooms, the number of bathroom, the view from the house (using a dummy variable: 1 = view, 0 = no view), the square footage of the house, the square footage of the lot, etc).

**PART 2: Assignment**

You are given the data on housing. The data are collected from the real estate pages of the *Boston Globe* during 1990.  These are homes that sold in the Boston, MA area. The source of the data is Wooldridge (2009) *Introductory Econometrics: A Modern Approach*, 4th Edition, Cengage

VARIABLES

  1. price                    price, in dollars

  2. assess                  assessed value, in dollars

  3. bdrms                  number of bedrooms

  4. lotsize                 size of lot, square feet

  5. sqrft                    size of house, square feet

Cut and paste in Excel the data set. Then, in Excel, obtain the logarithmic transformation of the following variables using the Excel function =LOG( . )

  6. lprice                   log(price) : dependent variable

  7. lassess                 log(assess) : independent variable

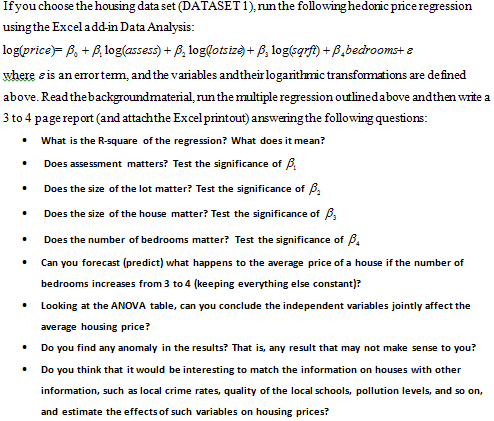
  8. llotsize                 log(lotsize) : independent variable

  9. lsqrft                    log(sqrft) : independent variable

**DATASET 1**

OBSERVATIONS

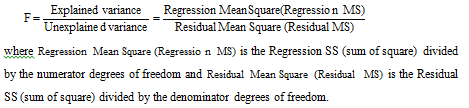
|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| PRICE | SQRFT | ASSESS | BDRMS | LOTSIZE |
| 300 | 2438 | 349.1 | 4 | 6126 |
| 370 | 2076 | 351.5 | 3 | 9903 |
| 191 | 1374 | 217.7 | 3 | 5200 |
| 195 | 1448 | 231.8 | 3 | 4600 |
| 373 | 2514 | 319.1 | 4 | 6095 |
| 466 | 2754 | 414.5 | 5 | 8566 |
| 332 | 2067 | 367.8 | 3 | 9000 |
| 315 | 1731 | 300.2 | 3 | 6210 |
| 206 | 1767 | 236.1 | 3 | 6000 |
| 240 | 1890 | 256.3 | 3 | 2892 |
| 285 | 2336 | 314 | 4 | 6000 |
| 300 | 2634 | 416.5 | 5 | 7047 |
| 405 | 3375 | 434 | 3 | 12237 |
| 212 | 1899 | 279.3 | 3 | 6460 |
| 265 | 2312 | 287.5 | 3 | 6519 |
| 227 | 1760 | 232.9 | 4 | 3597 |
| 240 | 2000 | 303.8 | 4 | 5922 |
| 285 | 1774 | 305.6 | 3 | 7123 |
| 268 | 1376 | 266.7 | 3 | 5642 |
| 310 | 1835 | 326 | 4 | 8602 |
| 266 | 2048 | 294.3 | 3 | 5494 |
| 270 | 2124 | 318.8 | 3 | 7800 |
| 225 | 1768 | 294.2 | 3 | 6003 |
| 150 | 1732 | 208 | 4 | 5218 |
| 247 | 1440 | 239.7 | 3 | 9425 |
| 275 | 1932 | 294.1 | 3 | 6114 |
| 230 | 1932 | 267.4 | 3 | 6710 |
| 343 | 2106 | 359.9 | 3 | 8577 |
| 477 | 3529 | 478.1 | 7 | 8400 |
| 350 | 2051 | 355.3 | 4 | 9773 |
| 230 | 1573 | 217.8 | 4 | 4806 |
| 335 | 2829 | 385 | 4 | 15086 |
| 251 | 1630 | 224.3 | 3 | 5763 |
| 235 | 1840 | 251.9 | 4 | 6383 |
| 361 | 2066 | 354.9 | 4 | 9000 |
| 190 | 1702 | 212.5 | 4 | 3500 |
| 360 | 2750 | 452.4 | 4 | 10892 |
| 575 | 3880 | 518.1 | 5 | 15634 |
| 209 | 1854 | 289.4 | 4 | 6400 |
| 225 | 1421 | 268.1 | 2 | 8880 |
| 246 | 1662 | 278.5 | 3 | 6314 |
| 713 | 3331 | 655.4 | 5 | 28231 |
| 248 | 1656 | 273.3 | 4 | 7050 |
| 230 | 1171 | 212.1 | 3 | 5305 |
| 375 | 2293 | 354 | 5 | 6637 |
| 265 | 1764 | 252.1 | 3 | 7834 |
| 313 | 2768 | 324 | 3 | 1000 |
| 417 | 3733 | 475.5 | 4 | 8112 |
| 253 | 1536 | 256.8 | 3 | 5850 |
| 315 | 1638 | 279.2 | 4 | 6660 |
| 264 | 1972 | 313.9 | 3 | 6637 |
| 255 | 1478 | 279.8 | 2 | 15267 |
| 210 | 1408 | 198.7 | 3 | 5146 |
| 180 | 1812 | 221.5 | 3 | 6017 |
| 250 | 1722 | 268.4 | 3 | 8410 |
| 250 | 1780 | 282.3 | 4 | 5625 |
| 209 | 1674 | 230.7 | 4 | 5600 |
| 258 | 1850 | 287 | 4 | 6525 |
| 289 | 1925 | 298.7 | 3 | 6060 |
| 316 | 2343 | 314.6 | 4 | 5539 |
| 225 | 1567 | 291 | 3 | 7566 |
| 266 | 1664 | 286.4 | 4 | 5484 |
| 310 | 1386 | 253.6 | 6 | 5348 |
| 471 | 2617 | 482 | 5 | 15834 |
| 335 | 2321 | 384.3 | 4 | 8022 |
| 495 | 2638 | 543.6 | 4 | 11966 |
| 279 | 1915 | 336.5 | 4 | 8460 |
| 380 | 2589 | 515.1 | 4 | 15105 |
| 325 | 2709 | 437 | 4 | 10859 |
| 220 | 1587 | 263.4 | 3 | 6300 |
| 215 | 1694 | 300.4 | 3 | 11554 |
| 240 | 1536 | 250.7 | 3 | 6000 |
| 725 | 3662 | 708.6 | 5 | 31000 |
| 230 | 1736 | 276.3 | 3 | 4054 |
| 306 | 2205 | 388.6 | 2 | 20700 |
| 425 | 1502 | 252.5 | 3 | 5525 |
| 318 | 1696 | 295.2 | 4 | 92681 |
| 330 | 2186 | 359.5 | 3 | 8178 |
| 246 | 1928 | 276.2 | 4 | 5944 |
| 225 | 1294 | 249.8 | 3 | 18838 |
| 111 | 1535 | 202.4 | 4 | 4315 |
| 268 | 1980 | 254 | 3 | 5167 |
| 244 | 2090 | 306.8 | 4 | 7893 |
| 295 | 1837 | 318.3 | 3 | 6056 |
| 236 | 1715 | 259.4 | 3 | 5828 |
| 202 | 1574 | 258.1 | 3 | 6341 |
| 219 | 1185 | 232 | 2 | 6362 |
| 242 | 1774 | 252 | 4 | 4950 |



Please keep in mind that when you interpret a regression coefficient, you are assuming that all the other variables remain constant.

**A Note on ANOVA**

The ANOVA table is used to test the null hypothesis that all regression coefficients (excluding the intercept term) are equal to zero against the alternative hypothesis that at least one is different from zero.  This test is known as the F test for regression. The F test is computed as follows, under the assumption that the null hypothesis is true:



The F statistics has two sets of degrees of freedom: numerator (attached to the Regression SS) and denominator degrees of freedom (attached to Residual SS).

Excel computes the F statistic for you in the ANOVA table, and computes in the last column the level of significance (*p*-value). If the level of significance of the test is less than 5%, you will reject at the 5% level the null hypothesis that all regression parameters are zero. On the other hand, if the level of significance is greater than 5%, you will accept (i.e., fail to reject) the null hypothesis that all regression parameters are zero.

**SLP Assignment Expectations**

In the Module 4 SLP Assignment, you are expected to:

* Describe the purpose of the paper and provide a conclusion.
* Present information in a professional manner.
* Answer the SLP Assignment question clearly and provide necessary details.
* Write clearly and correctly—that is, no poor sentence structure, no spelling and grammar mistakes, and no run-on sentences.
* Provide citations to support your argument and place references on a separate page. (All the sources that you listed in the references section must be cited in the paper.) Use APA format to provide citations and references [[*http://owl.english.purdue.edu/owl/resource/560/01/*](http://owl.english.purdue.edu/owl/resource/560/01/)].
* Type and double-space the paper.
* Whenever appropriate, please use Excel to show supporting computations in an appendix, present economic information in tables, and use the data to answer follow-up questions.