Midterm Exam Answers
Econometrics Stata Project
Professor Lemke
Spring 2007

1. Open a log file called yourfirstname_exam1.log. So, for example, my log file would be called rob_exam1.log.

2. Open the data set.

3. Use Stata's **describe** command to describe for you the data set. Feel free to summarize the data as well if that would help you better understand the data.

4. The dirtbikes.dta data set has how many variables? **11 variables**

5. The dirtbikes.dta data set has how many observations? **100 observations**

6. For each variable in the data set, indicate if the variable is a string or numeric variable.

Variable	String	Numeric
model	X	
firm	X	
msrp		X
cycles		X
displace		X
bore		X

Variable	String	Numeric
stroke		X
wbase		X
height		X
fuel		X
weight		X

7. Tabulate **firm** to see how many different firms are included in the data set. Drop all of the observations for which any particular firm has 5 or fewer observations. (Hint: you will end up with a total of 91 observations at this point.)

8. Create a separate dummy variable for each of the five remaining firms. Call each dummy variable the firm's name. Thus, you will create five dummy variables called **honda**, **husqvarna**, **ktm**, **kawasaki**, **suzuki**, and **yamaha**.

9. What percent of the sample does each of these five firms represent?

Firm	*Percent of Sample*
Honda	17.6%
Husqvarna	9.9%
KTM	19.8%
Kawasaki	16.5%
Suzuki	20.9%
Yamaha	15.4%

10. What is the average manufacturer's suggested retail price (MSRP) for the 91 bikes remaining in the sample?

    Average MSRP = $4,70.14

11. What is the average MSRP for each manufacturer/firm? (Hint: use a **sort** command followed by a **by:** command.)

Firm	*Percent of Sample*
Honda	$4,192.75
Husqvarna	$8,153.56
KTM	$5,569.72
Kawasaki	$3,732.33
Suzuki	$4,154.26
Yamaha	$3,979.71

12. Create a variable called **msrpclss** that equals 1 if the MSRP is at or below the 25th percentile MSRP for all bikes remaining in the sample, that equals 2 if the MSRP is above the 25th percentile MSRP and below the 75th percentile, and that equals 3 if the MSRP is at or above the 75th percentile MSRP. The only restriction in doing this is that you cannot type the actual 25th percentile and 75th percentile numbers into Stata. Feel free to complete this task however you feel comfortable. For those wanting a hint: start by **sum msrp, detail**. Following this, you can create two variables, one (called **msrp25**) that equals the 25th percentile msrp by including **gen msrp25=r(p25)** and one that equals the 75th percentile MSRP by including **gen msrp75=r(p75)**. From here it should be easy to create the classification variable defined above. Be careful on the equal signs.

13. Tab **msrpclss** to convince yourself you have done the previous step correctly. How many observations are in each class?

MSRP Class	Num. of Obs.
1	**25**
2	**43**
3	**23**

14. Do the number of observations per class make sense to you? Why?

    This distribution of observations looks correct as about one-fourth is in the first group (i.e., the first quartile), about one-half are in the inter-quartile range (i.e., between the 25th and 75th percentile), and about one-fourth are in the top quartile. One question is why the numbers are not more exact. If there would be 92 observations (instead of 91), then we would expect *exactly* 23 observations in the first group, 46 observations in the second group, and 23 observation in the third group. The reason we don't see this is because of observations that exactly equal the 25th or 75th percentile. (That is, it matters where one puts one's equal signs.)

15. Sum **msrp** for each **msrpclss** (hint: this can be easily done in one command following a **sort** command). Fill in the table below.

MSRP Class	Avg. MSRP.	Min MSRP	Max MSRP
1	$2,098	$1,079	$2,999
2	$4,867	$3,099	$6,248
3	$7,374	$6,299	$19,500

16. Do the results convince you that you defined **msrpclss** correctly? Explain.

    Not only do the average values increase with MSRP class, but more importantly, the maximum MSRP in the first class is less than the minimum MSRP in the second class. And, likewise, the maximum MSRP in the second class is less than the minimum MSRP in the third class.

17. Label the values of **msrpclass** as follows: a 1 is associated with "msrp<=25%tile", a 2 is associated with "msrp IQR" (IQR stands for inter-quartile range, i.e., between the 25th and 75th percentiles), and a 3 is associated with "msrp>=75%tile". **Tab msrpclss** to show the value labels.

18. When it comes to motorcycles, riders usually prefer a longer wheelbase, a higher bike, more fuel capacity, and a lower weight. Are each of these characteristics of dirt bikes also associated with higher MSRPs? Hint: to answer this question do NOT run a regression. Rather, simply compare the average of each characteristic across your previously defined MSRP classes (**msrpclass**).

    It is straightforward to summarize each of these characteristics by MSRP class. As expected, wheelbase, height, and fuel capacity all correspond to the expected pattern – the greater the characteristic, the higher the average price. Take for example, wheelbase. The average wheelbase is 43.6 inches for the cheapest 25% of bikes, 55.9 inches for the IQR of MSRP, and is 58.2 inches for the most expensive 25% of bikes. Weight, which was expected to be negatively correlated with msrp is actually positively associated with msrp.

19. Unless you are a dirt bike or motorcycle junkie, you probably don't know what characteristics the variables **displace**, **bore**, or **stroke** capture. Using the same commands as in question 18, how do **displace**, **bore**, and **stroke** generally relate to MSRP?

    Using the same technique as in question 18, the same results hold for **displace**, **bore**, and **stroke**. That is, the average value of each of these three characteristics is highest for MSRP class = 3 and lowest for MSRP class = 1. Thus, not knowing what **displace**, **bore**, or **stroke** stand for, it is a good guess that all three characteristics are valued by potential customers.

20. Create two dummy variables, **cycle2** and **cylcle4**, defined in the obvious way.

21. How many dirt bikes in the sample of 91 models offer 2-cycle engines? **31 2-cycle engines**

22. How many dirt bikes in the sample of 91 models offer a 4-cycle engine? **60 4-cycle engines**

23. Create a variable called **lnmsrp** that equals the natural logarithm of the MSRP.

24. Summarize all three of your newly created variables – **cycle2**, **cycle4**, and **lnmsrp**.

Variable	*Mean*
cycle2	0.3407
cycle4	0.6593
lnmsrp	8.3296

25. Execute a regression where the dependent variable measuring the MSRP is explained by the number of cylinder engine, ill-defined bike characteristics (**displace**, **bore**, and **stroke)**, well-defined bike characteristics (wheelbase, the bike's height, fuel capacity, and the bike's weight), and the bike's manufacturer. Create your regression model in a way that it is easy to compare the effect of different manufacturers to Honda.

    Note that to fulfill the requirements regarding comparisons to Honda that **honda** is the omitted firm variable.

26. What does your regression from question 25 imply say about 2- vs. 4-cycle engines? Be specific.

    A 4-cycle dirt bike is expected to have a MSRP that is $526.63 less than a comparable bike that has a 2-cycle engine. This effect, however, is not statistically significant.

27. What does your regression from question 25 imply about bike characteristics (ill-defined and well-defined)? Your answer(s) can be very general and geared simply toward statistical significance.

    None of the ill-defined or well-defined bike characteristics are statistically significant, and two – **displace** and **fuel** – have estimated coefficients opposite in sign of what was expected. (Recall that it was expected that the coefficient on **weight** would be negative.)

28. What does your regression from question 25 imply about the value of brand names? Be fairly precise.

    Compared to the Honda manufacturer, a comparable bike made by Husqvarna is expected to have a MSRP that is $1,901 higher. This effect is also very statistically significant (p-value = 0.007). None of the other manufacturers have a predicted effect that is statistically different from Honda, although KTMs are expected to have a higher MSRP (by $638) while Kawasaki ($225), Suzuki ($94), and Yamahas ($59) are all expected to have a lower MSRP compared to Honda.

29. Execute an identical regression as in question 25 with one change – the dependent variable is the natural log of MSRP.

30. What does your regression from question 29 imply say about 2- vs. 4-cycle engines? Be specific.

    A 4-cycle dirt bike is expected to have a MSRP that is 12 percent less than a comparable bike that has a 2-cycle engine. This effect, however, is only significant at the 10% level (with a p-value of 0.084).

31. What does your regression from question 29 imply about bike characteristics (ill-defined and well-defined)? Your answer(s) can be very general and geared simply toward statistical significance.

    Every additional inch in wheelbase is expected to be associated with a MSRP that is 5.4 percent higher than an otherwise comparable bike. None of the other characteristics are statistically significantly related to MSRP.

32. What does your regression from question 29 imply about the value of brand names? Be fairly precise.

    Compared to the Honda manufacturer, a comparable bike made by Husqvarna is expected to have a MSRP that is 24% higher and a comparable bike made by KTM is expected to have a MSRP that is 19.6% higher. Both of these effects are statistically significant with *p*-values that are under 0.01. None of the other manufacturers have a predicted effect that is statistically different from Honda

33. In the regression from question 25, what is the predicted effect of having a comparable bike made by Kawasaki vs. KTM? You should notice that you can answer this question, but you would not be able to answer a question that asked if this effect was statistically significant.

    The regression in question 25 suggests that a bike made by KTM is expected to have a MSRP that is \$638 – (\$225) = \$864 more than a comparable bike made by Kawasaki.

34. Estimate a new regression (but very similar to the one in question 25) that would allow for you to determine if the difference between Kawasaki and KTM is statistically significant. Is the difference statistically significant? How do you know?

    In the new regression, the coefficient estimate of -\$864 appears (when KTM is the omitted firm), and this estimate is now seen to not be statistically significant as the *p*-value is 0.113.

35. If one looks at both regressions in questions 25 and 29, it appears that very few bike characteristics affect the MSRP. Looking at **displace**, **bore**, and **stroke** in both regressions, if you were to keep just one of these three variables, which one would it likely be? Why? Similarly, looking at both regressions in questions 25 and 29, if you were to keep two variables out of **wbase**, **height**, **fuel**, and **weight**, which two would they be? Why?

    Looking at both regressions, I would use **bore** instead of **displace** or **stroke** because **bore** has the greatest *t*-statistic in both regressions. One could also argue that **bore** has the greatest estimated magnitude, but this is a weak argument as we know that units of measurement will affect the order of magnitude of coefficient estimates. Likewise, looking across the two regressions, I would be again tempted to use **wbase** and **weight** because both are associated with greater *t*-statistics than **height** or **fuel**. Certainly the second regression suggests that **wbase** should be included in the regression.

36. Estimate two new regressions – one with **msrp** as the dependent variable and one with **lnmsrp** as the dependend variable. Use the same explanatory variables as you did in questions 25 and 29 with the exception that you will continue to include **bore**, **wbase**, and **weight** and no longer include **displace**, **stroke**, **height**, or **fuel**. Comment on the overall set of results in these two equations compared to the two equations estimated in questions 25 and 29.

    These new regression results indicate that all of the (remaining) bike characteristics are statistically significantly related to MSRP. In each case, **bore** and **wbase** are positively related to MSRP but that **weight** is negatively related to MSRP.

37. Why do you think it is that the 3 remaining bike characteristics are all statistically significant in part question 36?

    The reason why the bike characteristics became statistically significant in question 36 compared to questions 25 and 29 is that the seven bike characteristics are highly correlated with one another. When two (or more) variables that are highly correlated with one another are included in a regression, the standard error of the estimates will necessarily increase (and sometimes explode). Thus, it can typically be best to include just one or two characteristics.

    Consider, for example, estimating the growth rate of a country. The infant mortality rate may be a good indicator of growth – the lower the mortality rate, the higher the growth. But, if one included the infant mortality rate, the infant illiteracy rate, the infant poverty rate, and the infant vaccination rate, it may very well turn out that a regression fails to identify any of these characteristics as being statistically significant, even though they are (or, at least, looked at correctly, the collection of these characteristics are informative when it comes to growth).

38. Save your current data set at yourfirstname_exam1.dta. So, I would save my data set as rob_exam1.dta.

39. Close your log file.

40. Email me (lemke@lakeforest.edu) your log file and your edited data set.

```
      log:  C:\a_office\Econ 330 2006-07 Spring\exams\rob_exam1.log
  log type:  text
 opened on:  26 Feb 2007, 11:49:00

. use dirtbikes
. desc

Contains data from dirtbikes.dta
  obs:           100
 vars:            11                          21 Feb 2007 09:28
 size:         5,700 (99.9% of memory free)
-------------------------------------------------------------------------------
              storage  display     value
variable name   type   format      label      variable label
-------------------------------------------------------------------------------
model           str16  %16s                   Model of Dirtbike
firm            str9   %9s                    Manufacturer of Dirtbike
msrp            int    %8.0g                  Firm's Suggested Retail Price
cycles          byte   %8.0g                  Bike has 2 or 4 cycle engine
displace        float  %9.0g
bore            byte   %8.0g
stroke          float  %9.0g
wbase           float  %9.0g                  distance b/w wheels in inches
height          float  %9.0g                  height of bike in inches
fuel            float  %9.0g                  fuel capacity in gallons
weight          float  %9.0g                  weight of bike in pounds
-------------------------------------------------------------------------------

. sum
    Variable |       Obs        Mean    Std. Dev.       Min        Max
-------------+--------------------------------------------------------
       model |         0
        firm |         0
        msrp |       100      4951.3    2476.373       1079      19500
      cycles |       100         3.3     .958745          2          4
    displace |       100     267.575    173.7326         49        651
-------------+--------------------------------------------------------
        bore |       100       71.11    20.12431         39        100
      stroke |       100     57.7647    10.94021         38         83
       wbase |       100     53.3258    6.900448       33.7       58.9
      height |       100     33.7342    5.064095       18.9       39.2
        fuel |       100      1.9963    .8650377        .48        6.1
-------------+--------------------------------------------------------
      weight |       100    202.8566    57.69227         82        337

. tab firm

Manufacture |
       r of |
   Dirtbike |      Freq.     Percent        Cum.
------------+-----------------------------------
        ATK |          3        3.00        3.00
     GasGas |          4        4.00        7.00
      Honda |         16       16.00       23.00
   Husaberg |          2        2.00       25.00
  Husqvarna |          9        9.00       34.00
        KTM |         18       18.00       52.00
   Kawasaki |         15       15.00       67.00
     Suzuki |         19       19.00       86.00
     Yamaha |         14       14.00      100.00
------------+-----------------------------------
      Total |        100      100.00
```

```
. drop if firm=="ATK"|firm=="GasGas"|firm=="Husaberg"
(9 observations deleted)

. tab firm

Manufacture |
       r of |
   Dirtbike |      Freq.     Percent        Cum.
------------+-----------------------------------
      Honda |         16       17.58       17.58
  Husqvarna |          9        9.89       27.47
        KTM |         18       19.78       47.25
   Kawasaki |         15       16.48       63.74
     Suzuki |         19       20.88       84.62
     Yamaha |         14       15.38      100.00
------------+-----------------------------------
      Total |         91      100.00

. gen honda=(firm=="Honda")

. gen husqvarna=(firm=="Husqvarna")

. gen ktm=(firm=="KTM")

. gen kawasaki=(firm=="Kawasaki")

. gen suzuki=(firm=="Suzuki")

. gen yamaha=(firm=="Yamaha")

. sum honda husqvarna ktm kawasaki suzuki yamaha

    Variable |       Obs        Mean    Std. Dev.       Min        Max
-------------+--------------------------------------------------------
       honda |        91    .1758242    .3827795          0          1
   husqvarna |        91    .0989011    .3001831          0          1
         ktm |        91    .1978022    .4005491          0          1
    kawasaki |        91    .1648352    .3730873          0          1
      suzuki |        91    .2087912    .4086967          0          1
-------------+--------------------------------------------------------
      yamaha |        91    .1538462    .3628001          0          1

. sum msrp

    Variable |       Obs        Mean    Std. Dev.       Min        Max
-------------+--------------------------------------------------------
        msrp |        91    4740.143    2462.165       1079      19500
```

```
. sort firm

. by firm: sum msrp

-------------------------------------------------------------------------------
-> firm = Honda

    Variable |       Obs        Mean    Std. Dev.       Min        Max
-------------+--------------------------------------------------------
        msrp |        16     4192.75    1952.424       1249       6999

-------------+--------------------------------------------------------
-> firm = Husqvarna

    Variable |       Obs        Mean    Std. Dev.       Min        Max
-------------+--------------------------------------------------------
        msrp |         9    8153.556    4275.075       5999      19500

-------------+--------------------------------------------------------
-> firm = KTM

    Variable |       Obs        Mean    Std. Dev.       Min        Max
-------------+--------------------------------------------------------
        msrp |        18    5569.722    1915.265       1598       7548

-------------+--------------------------------------------------------
-> firm = Kawasaki

    Variable |       Obs        Mean    Std. Dev.       Min        Max
-------------+--------------------------------------------------------
        msrp |        15    3732.333    1482.236       1099       5999

-------------+--------------------------------------------------------
-> firm = Suzuki

    Variable |       Obs        Mean    Std. Dev.       Min        Max
-------------+--------------------------------------------------------
        msrp |        19    4154.263    1571.172       1099       6499

-------------+--------------------------------------------------------
-> firm = Yamaha

    Variable |       Obs        Mean    Std. Dev.       Min        Max
-------------+--------------------------------------------------------
        msrp |        14    3979.714    2014.633       1079       6599


. sum msrp, detail

                Firm's Suggested Retail Price
-------------------------------------------------------------
      Percentiles      Smallest
 1%         1079           1079
 5%         1249           1099
10%         1699           1099       Obs                  91
25%         2999           1249       Sum of Wgt.          91

50%         5099                      Mean           4740.143
                        Largest       Std. Dev.      2462.165
75%         6299           7299
90%         6899           7348       Variance        6062255
95%         7289           7548       Skewness       2.158994
99%        19500          19500       Kurtosis         15.195
```

```
. gen msrp25=r(p25)

. gen msrp75=r(p75)

. gen msrpclss=2-(msrp<=msrp25)+(msrp>=msrp75)

. tab msrpclss

   msrpclss |      Freq.     Percent        Cum.
------------+-----------------------------------
          1 |         25       27.47       27.47
          2 |         43       47.25       74.73
          3 |         23       25.27      100.00
------------+-----------------------------------
      Total |         91      100.00

. sort msrpclss

. by msrpclss: sum msrp

-------------+-------------------------------------------------------------
-> msrpclss = 1

    Variable |       Obs        Mean    Std. Dev.       Min        Max
-------------+-------------------------------------------------------------
        msrp |        25     2098.08    662.9945       1079       2999

-------------+-------------------------------------------------------------
-> msrpclss = 2

    Variable |       Obs        Mean    Std. Dev.       Min        Max
-------------+-------------------------------------------------------------
        msrp |        43    4867.488     1019.51       3099       6248

-------------+-------------------------------------------------------------
-> msrpclss = 3

    Variable |       Obs        Mean    Std. Dev.       Min        Max
-------------+-------------------------------------------------------------
        msrp |        23     7373.87     2668.41       6299      19500


. label define msrpclss 1 "msrp<=25%tile" 2 "msrp IQR" 3 "msrp>=75%tile"

. label values msrpclss msrpclss

. tab msrpclss

     msrpclss |      Freq.     Percent        Cum.
--------------+-----------------------------------
msrp<=25%tile |         25       27.47       27.47
     msrp IQR |         43       47.25       74.73
msrp>=75%tile |         23       25.27      100.00
--------------+-----------------------------------
        Total |         91      100.00
```

```
. sort msrpclss

. by msrpclss: sum wbase height fuel weight

-------------+-----------------------------------------------------------
-> msrpclss = msrp<=25%tile

    Variable |       Obs        Mean    Std. Dev.       Min        Max
-------------+-----------------------------------------------------------
       wbase |        25      43.596    6.109287       33.7       52.2
      height |        25        27.6    4.866552       18.9       34.6
        fuel |        25      1.2052    .5045222        .48        2.2
      weight |        25    136.3668    38.34768         82        216

-------------+-----------------------------------------------------------
-> msrpclss = msrp IQR

    Variable |       Obs        Mean    Std. Dev.       Min        Max
-------------+-----------------------------------------------------------
       wbase |        43    55.94605    3.388238      44.76       58.9
      height |        43    35.99767    2.071288       29.5       39.2
        fuel |        43    2.327674    .8918543         .5        6.1
      weight |        43    225.2644     51.8769     122.57        337

-------------+-----------------------------------------------------------
-> msrpclss = msrp>=75%tile

    Variable |       Obs        Mean    Std. Dev.       Min        Max
-------------+-----------------------------------------------------------
       wbase |        23    58.15739    .5151983         57      58.86
      height |        23    37.12435    1.011797      35.83       39.2
        fuel |        23    2.359565    .4486898        1.8       3.43
      weight |        23    236.3965     10.8629      218.5        255


. by msrpclss: sum displace bore stroke

-------------+-----------------------------------------------------------
-> msrpclss = msrp<=25%tile

    Variable |       Obs        Mean    Std. Dev.       Min        Max
-------------+-----------------------------------------------------------
    displace |        25       87.32    32.81478         49        157
        bore |        25       48.56    7.018309         39         64
      stroke |        25       45.44    5.083306         38         54

-------------+-----------------------------------------------------------
-> msrpclss = msrp IQR

    Variable |       Obs        Mean    Std. Dev.       Min        Max
-------------+-----------------------------------------------------------
    displace |        43    265.8837    164.4486         65        651
        bore |        43    70.83721    16.28457         41        100
      stroke |        43    60.30233    10.78256         45         83

-------------+-----------------------------------------------------------
-> msrpclss = msrp>=75%tile

    Variable |       Obs        Mean    Std. Dev.       Min        Max
-------------+-----------------------------------------------------------
    displace |        23    432.6957     81.7821        249        510
        bore |        23    90.86957    9.550366         66         97
      stroke |        23    66.15087    5.179178         55         72
```

```
. gen cycle2=(cycles==2)

. gen cycle4=(cycles==4)

. tab cycle2

     cycle2 |      Freq.     Percent        Cum.
------------+-----------------------------------
          0 |         60       65.93       65.93
          1 |         31       34.07      100.00
------------+-----------------------------------
      Total |         91      100.00

. tab cycle4

     cycle4 |      Freq.     Percent        Cum.
------------+-----------------------------------
          0 |         31       34.07       34.07
          1 |         60       65.93      100.00
------------+-----------------------------------
      Total |         91      100.00

. gen lnmsrp=ln(msrp)

. sum cycle2 cycle4 lnmsrp

    Variable |       Obs        Mean    Std. Dev.       Min        Max
-------------+--------------------------------------------------------
      cycle2 |        91    .3406593    .4765566          0          1
      cycle4 |        91    .6593407    .4765566          0          1
      lnmsrp |        91    8.329599    .5501588    6.98379    9.87817

. reg msrp cycle4 displace bore stroke wbase height fuel weight husqvarna ktm kawasaki
suzuki yamaha

      Source |       SS       df       MS              Number of obs =      91
-------------+------------------------------           F( 13,    77) =   14.60
       Model |   388136293    13  29856637.9           Prob > F      =  0.0000
    Residual |   157466686    77   2045021.9           R-squared     =  0.7114
-------------+------------------------------           Adj R-squared =  0.6627
       Total |   545602979    90  6062255.32           Root MSE      =    1430

------------------------------------------------------------------------------
        msrp |      Coef.   Std. Err.      t    P>|t|     [95% Conf. Interval]
-------------+----------------------------------------------------------------
      cycle4 |  -526.6332   566.6769    -0.93   0.356    -1655.031    601.7646
    displace |  -2.231732   6.587605    -0.34   0.736    -15.34933    10.88587
        bore |   82.24966   58.59595     1.40   0.164    -34.42978    198.9291
      stroke |   50.79034   48.04992     1.06   0.294    -44.88927      146.47
       wbase |   148.6344   119.2717     1.25   0.216    -88.86587    386.1347
      height |   23.14847   118.1109     0.20   0.845    -212.0403    258.3373
        fuel |  -87.75307   377.4096    -0.23   0.817    -839.2717    663.7655
      weight |  -17.24344   11.92882    -1.45   0.152    -40.99676    6.509872
   husqvarna |    1901.28   684.5399     2.78   0.007     538.1872    3264.373
         ktm |   638.5985   581.0172     1.10   0.275    -518.3545    1795.551
    kawasaki |  -225.8236   554.9785    -0.41   0.685    -1330.927    879.2798
      suzuki |  -94.14523   506.8911    -0.19   0.853    -1103.494    915.2038
      yamaha |  -58.66799   548.1547    -0.11   0.915    -1150.183    1032.848
       _cons |  -8244.084   2329.668    -3.54   0.001    -12883.05   -3605.122
------------------------------------------------------------------------------
```

```
. reg lnmsrp cycle4 displace bore stroke wbase height fuel weight husqvarna ktm
kawasaki suzuki yamaha

      Source |       SS       df       MS              Number of obs =      91
-------------+------------------------------           F( 13,    77) =   63.86
       Model |  24.9284708    13  1.91757468           Prob > F      =  0.0000
    Residual |  2.31224929    77  .030029212           R-squared     =  0.9151
-------------+------------------------------           Adj R-squared =  0.9008
       Total |  27.2407201    90  .302674667           Root MSE      =  .17329

------------------------------------------------------------------------------
      lnmsrp |      Coef.   Std. Err.      t    P>|t|     [95% Conf. Interval]
-------------+----------------------------------------------------------------
      cycle4 |  -.1201713   .0686686    -1.75   0.084    -.2569081    .0165654
    displace |   .0003314   .0007983     0.42   0.679    -.0012581     .001921
        bore |    .006863   .0071005     0.97   0.337    -.0072759     .021002
      stroke |   .0000223   .0058226     0.00   0.997     -.011572    .0116165
       wbase |   .0540751   .0144531     3.74   0.000     .0252953    .0828548
      height |   .0143915   .0143124     1.01   0.318    -.0141081    .0428912
        fuel |  -.0387105   .0457337    -0.85   0.400    -.1297779    .0523568
      weight |  -.0015634   .0014455    -1.08   0.283    -.0044418    .0013149
   husqvarna |   .2406274    .082951     2.90   0.005     .0754508    .4058039
         ktm |   .1956678   .0704064     2.78   0.007     .0554708    .3358648
    kawasaki |  -.0315998   .0672511    -0.47   0.640    -.1655138    .1023142
      suzuki |  -.0039396   .0614239    -0.06   0.949    -.1262503     .118371
      yamaha |  -.0306413   .0664242    -0.46   0.646    -.1629087    .1016261
       _cons |   4.826943    .282304    17.10   0.000     4.264804    5.389082
------------------------------------------------------------------------------

. reg msrp cycle4 displace bore stroke wbase height fuel weight honda husqvarna
kawasaki suzuki yamaha

      Source |       SS       df       MS              Number of obs =      91
-------------+------------------------------           F( 13,    77) =   14.60
       Model |   388136293    13  29856637.9           Prob > F      =  0.0000
    Residual |   157466686    77   2045021.9           R-squared     =  0.7114
-------------+------------------------------           Adj R-squared =  0.6627
       Total |   545602979    90  6062255.32           Root MSE      =    1430

------------------------------------------------------------------------------
        msrp |      Coef.   Std. Err.      t    P>|t|     [95% Conf. Interval]
-------------+----------------------------------------------------------------
      cycle4 |  -526.6332   566.6769    -0.93   0.356    -1655.031    601.7646
    displace |  -2.231732   6.587605    -0.34   0.736    -15.34933    10.88587
        bore |   82.24966   58.59595     1.40   0.164    -34.42978    198.9291
      stroke |   50.79034   48.04992     1.06   0.294    -44.88927      146.47
       wbase |   148.6344   119.2717     1.25   0.216    -88.86587    386.1347
      height |   23.14847   118.1109     0.20   0.845    -212.0403    258.3373
        fuel |  -87.75307   377.4096    -0.23   0.817    -839.2717    663.7655
      weight |  -17.24344   11.92882    -1.45   0.152    -40.99676    6.509872
       honda |  -638.5985   581.0172    -1.10   0.275    -1795.551    518.3545
   husqvarna |   1262.682   678.3436     1.86   0.067      -88.073    2613.436
    kawasaki |  -864.4221   539.8292    -1.60   0.113    -1939.359    210.5153
      suzuki |  -732.7437   533.8269    -1.37   0.174    -1795.729    330.2415
      yamaha |  -697.2664   610.1429    -1.14   0.257    -1912.216    517.6833
       _cons |  -7605.486   2472.089    -3.08   0.003    -12528.04   -2682.929
------------------------------------------------------------------------------
```

```
. reg msrp cycle4 bore wbase weight husqvarna ktm kawasaki suzuki yamaha

      Source |       SS       df       MS              Number of obs =      91
-------------+------------------------------           F(  9,    81) =   21.55
       Model |   384874949     9  42763883.3           Prob > F      =  0.0000
    Residual |   160728030    81  1984296.66           R-squared     =  0.7054
-------------+------------------------------           Adj R-squared =  0.6727
       Total |   545602979    90  6062255.32           Root MSE      =  1408.7

------------------------------------------------------------------------------
        msrp |      Coef.   Std. Err.      t    P>|t|     [95% Conf. Interval]
-------------+----------------------------------------------------------------
      cycle4 |   -752.184   455.2963    -1.65   0.102    -1658.081    153.7128
        bore |   74.66904   18.95268     3.94   0.000     36.95914    112.3789
       wbase |   174.9823   45.41754     3.85   0.000      84.6156    265.3489
      weight |   -13.3078   7.287002    -1.83   0.071    -27.80664     1.19105
   husqvarna |   1812.742   654.4649     2.77   0.007     510.5619    3114.922
         ktm |   739.9698   529.6921     1.40   0.166    -313.9513    1793.891
    kawasaki |  -281.0335   527.7924    -0.53   0.596    -1331.175    769.1079
      suzuki |  -144.0963   488.5098    -0.29   0.769    -1116.078    827.8849
      yamaha |   38.63287   519.9311     0.07   0.941     -995.867    1073.133
       _cons |  -6812.983   1527.532    -4.46   0.000    -9852.292   -3773.674
------------------------------------------------------------------------------

. reg lnmsrp cycle4 bore wbase weight husqvarna ktm kawasaki suzuki yamaha

      Source |       SS       df       MS              Number of obs =      91
-------------+------------------------------           F(  9,    81) =   93.98
       Model |  24.8599035     9  2.76221149           Prob > F      =  0.0000
    Residual |  2.38081661    81  .029392798           R-squared     =  0.9126
-------------+------------------------------           Adj R-squared =  0.9029
       Total |  27.2407201    90  .302674667           Root MSE      =  .17144

------------------------------------------------------------------------------
      lnmsrp |      Coef.   Std. Err.      t    P>|t|     [95% Conf. Interval]
-------------+----------------------------------------------------------------
      cycle4 |  -.1581012    .055413    -2.85   0.005    -.2683556   -.0478469
        bore |   .0110468   .0023067     4.79   0.000     .0064572    .0156364
       wbase |   .0636711   .0055277    11.52   0.000     .0526728    .0746694
      weight |  -.0024024   .0008869    -2.71   0.008     -.004167   -.0006378
   husqvarna |   .2140624   .0796533     2.69   0.009     .0555774    .3725474
         ktm |   .1673077   .0644675     2.60   0.011     .0390376    .2955777
    kawasaki |  -.0578021   .0642363    -0.90   0.371    -.1856121    .0700079
      suzuki |  -.0204031   .0594553    -0.34   0.732    -.1387004    .0978943
      yamaha |  -.0228429   .0632795    -0.36   0.719    -.1487493    .1030634
       _cons |   4.733581    .185912    25.46   0.000     4.363675    5.103488
------------------------------------------------------------------------------

. save rob_exam1
file rob_exam1.dta saved

. log close
       log:  C:\a_office\Econ 330 2006-07 Spring\exams\rob_exam1.log
  log type:  text
 closed on:  26 Feb 2007, 12:21:52
-------------------------------------------------------------------------------
```