PS8

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1   Question 9

Table 1: Results for Linear Model

	Dependent variable:
	y
X1	1.501***
	(0.002)
X2	−0.991***
	(0.003)
X3	−0.247***
	(0.003)
X4	0.744***
	(0.003)
X5	3.504***
	(0.003)
X6	−1.999***
	(0.003)
X7	0.502***
	(0.003)
X8	0.997***
	(0.003)
X9	1.256***
	(0.003)
X10	1.999***
	(0.003)
Observations	100,000
R^2	0.971
Adjusted R^2	0.971
Residual Std. Error	0.500 (df = 99990)
F Statistic	338,240.000*** (df = 10; 99990)

Notes: Superscripts *, ** and *** represent significance ate 10%, 5% and 1% respectively.

Table 1 shows the results for the linear model, while figure 1 depicts the results for all the estimations. They are all really similar and, ultimately, they reach the same value if we set a large number of simulations.

```
> cbind(betaTrue,beta.hat.matrix,LBFGS.result,NM.result, BETA.HAT.MLE.lbfg.final,betalm)
     betaTrue             LBFGS.result   NM.result  BETA.HAT.MLE.lbfg.final       betalm
x1       1.50  1.5005793    1.5005793  1.4621621                 1.5005793  1.5005793
x2      -1.00 -0.9912364   -0.9912364 -0.9774386                -0.9912364 -0.9912364
x3      -0.25 -0.2472997   -0.2472997 -0.2335251                -0.2472996 -0.2472997
x4       0.75  0.7443806    0.7443806  0.7746308                 0.7443806  0.7443806
x5       3.50  3.5035338    3.5035338  3.5069772                 3.5035338  3.5035338
x6      -2.00 -1.9988729   -1.9988729 -1.9709923                -1.9988729 -1.9988729
x7       0.50  0.5022677    0.5022677  0.5374785                 0.5022677  0.5022677
x8       1.00  0.9974801    0.9974801  0.9711296                 0.9974801  0.9974801
x9       1.25  1.2556600    1.2556600  1.2434229                 1.2556600  1.2556600
x10      2.00  1.9987692    1.9987692  2.0017429                 1.9987692  1.9987692
>
```

Figure 1: Results for Different Estimations