```
/*****************************************************************
**************
Problem 3: The impact of marketing spending on firm profits
******************************************************************
*************/
*3.1) Simulating the true data
set seed 1
set obs 100000

*generate X1 marketing spending variable
gen X1 = rnormal(0,3)

*generate X2, managment quality variable
set seed 2
gen Z2 = rnormal(0,1)
gen X2 = 1/2*X1 + 1/2*Z2

*generate Y, profit variable
set seed 3
gen Z3= rnormal(0,1)
gen Y= 15-0.5*X1 + 2*X2 + Z3

*Regression
reg Y X1 X2

*3.2 Omitting the management quality variable
reg Y X1

*comment:The relationship between profit and marketing spending is now positive

/* The result differ from the true relation because we omit to control for the
management quality*/

*3.3 Introducing a noisy variable for managment quality
gen X2m = 1/2*X1 + 2*Z2

reg Y X1 X2m

/* The relationship between profit and marketing spending is still positive.
 However the magnitude of the marketing spending coefficient decreases with the
 ad of the management proxy in the regression.
 The result differ from the true relation because the managment quality used
 is very noisy which prevents us to estimated the true relationship. */
```

```
 *3.4) Perfectly measure managment quality, but with high marketing correlation
gen X2alt = 0.5*X1 + 0.001*Z2
gen Yalt= 15-0.5*X1 + 2*X2alt

reg Yalt X1 X2alt

*The coefficients are the same as for the true model.
*The problem here is that management are highly correlated with marketing correlation
```