4.14

a. CM 与 FLR 反比，CM 与 PGNP 反比，CM 与 TFR 反比

b.

Dependent Variable: CM
Method: Least Squares
Date: 07/14/20 Time: 23:21
Sample: 1 64
Included observations: 64

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	263.8635	12.22499	21.58395	0.0000
FLR	-2.390496	0.213263	-11.20917	0.0000

R-squared	0.669590	Mean dependent var	141.5000
Adjusted R-squared	0.664261	S.D. dependent var	75.97807
S.E. of regression	44.02399	Akaike info criterion	10.43810
Sum squared resid	120163.0	Schwarz criterion	10.50556
Log likelihood	-332.0191	Hannan-Quinn criter.	10.46468
F-statistic	125.6455	Durbin-Watson stat	2.314744
Prob(F-statistic)	0.000000		

c.

Dependent Variable: CM
Method: Least Squares
Date: 07/14/20 Time: 23:22
Sample: 1 64
Included observations: 64

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	263.6416	11.59318	22.74109	0.0000
FLR	-2.231586	0.209947	-10.62927	0.0000
PGNP	-0.005647	0.002003	-2.818703	0.0065

R-squared	0.707665	Mean dependent var	141.5000
Adjusted R-squared	0.698081	S.D. dependent var	75.97807
S.E. of regression	41.74780	Akaike info criterion	10.34691
Sum squared resid	106315.6	Schwarz criterion	10.44811
Log likelihood	-328.1012	Hannan-Quinn criter.	10.38678
F-statistic	73.83254	Durbin-Watson stat	2.186159
Prob(F-statistic)	0.000000		

d.

Dependent Variable: CM
Method: Least Squares
Date: 07/14/20 Time: 23:23
Sample: 1 64
Included observations: 64

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	168.3067	32.89165	5.117003	0.0000
FLR	-1.768029	0.248017	-7.128663	0.0000
PGNP	-0.005511	0.001878	-2.934275	0.0047
TFR	12.86864	4.190533	3.070883	0.0032

R-squared	0.747372	Mean dependent var	141.5000
Adjusted R-squared	0.734740	S.D. dependent var	75.97807
S.E. of regression	39.13127	Akaike info criterion	10.23218
Sum squared resid	91875.38	Schwarz criterion	10.36711
Log likelihood	-323.4298	Hannan-Quinn criter.	10.28534
F-statistic	59.16767	Durbin-Watson stat	2.170318
Prob(F-statistic)	0.000000		

R^2形式的ANOVA表格

变异来源	平方和	自由度	$MSS = \frac{ss}{d.f}$
来源于回归(ESS)	**68665.0879**	**2**	**34332.54395**
来源于残差(RSS)	**23210.294**	**61**	**380.496623**
总和(TSS)	**91875.38193**	**63**	

e. 选择包含FLR,PGNP,TFR变量的回归模型，R^2=0.75，修正的 R^2=0.73，模型整体拟合效果较好，模型对CM的解释力度达到了73%，F统计量等于59.17，在5%的显著性水平下它是显著的，说明模型整体上是显著的。

g. 运用逐步回归的方法，使用矫正的判定系数,使用了F检验

Dependent Variable: CM
Method: Least Squares
Date: 07/15/20 Time: 00:05
Sample: 1 64
Included observations: 64

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	166.3852	34.87613	4.770747	0.0000
FLR	-1.912649	0.257787	-7.419494	0.0000
TFR	13.15723	4.443020	2.961325	0.0044

R-squared	0.711120	Mean dependent var	141.5000
Adjusted R-squared	0.701648	S.D. dependent var	75.97807
S.E. of regression	41.50044	Akaike info criterion	10.33503
Sum squared resid	105059.5	Schwarz criterion	10.43622
Log likelihood	-327.7208	Hannan-Quinn criter.	10.37489
F-statistic	75.08001	Durbin-Watson stat	2.214202
Prob(F-statistic)	0.000000		

Dependent Variable: CM
Method: Least Squares
Date: 07/14/20 Time: 23:22
Sample: 1 64
Included observations: 64

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	263.6416	11.59318	22.74109	0.0000
FLR	-2.231586	0.209947	-10.62927	0.0000
PGNP	-0.005647	0.002003	-2.818703	0.0065

R-squared	0.707665	Mean dependent var	141.5000
Adjusted R-squared	0.698081	S.D. dependent var	75.97807
S.E. of regression	41.74780	Akaike info criterion	10.34691
Sum squared resid	106315.6	Schwarz criterion	10.44811
Log likelihood	-328.1012	Hannan-Quinn criter.	10.38678
F-statistic	73.83254	Durbin-Watson stat	2.186159
Prob(F-statistic)	0.000000		

Dependent Variable: CM
Method: Least Squares
Date: 07/14/20 Time: 23:21
Sample: 1 64
Included observations: 64

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	263.8635	12.22499	21.58395	0.0000
FLR	-2.390496	0.213263	-11.20917	0.0000

R-squared	0.669590	Mean dependent var	141.5000
Adjusted R-squared	0.664261	S.D. dependent var	75.97807
S.E. of regression	44.02399	Akaike info criterion	10.43810
Sum squared resid	120163.0	Schwarz criterion	10.50556
Log likelihood	-332.0191	Hannan-Quinn criter.	10.46468
F-statistic	125.6455	Durbin-Watson stat	2.314744
Prob(F-statistic)	0.000000		

引入不同变量后，在0.05的置信水平下，均可以通过F检验，但引入TFR变量比较合适，因为矫正的判定系数增加的较多。