

Pendugaan GMM menggunakan program R3.0.1

X <-

```
matrix (c(-0.0483954,11.57731,0.534487,  
-0.0133315,11.61102,0.532328,  
0.0879925,11.61344,0.547736,  
0.1619318,11.71156,0.540846,  
0.1485665,12.18896,0.591167,  
0.1602123,12.48978,0.575417,  
0.2550375,12.48162,0.594495,  
0.3297856,12.6648,0.597409,  
0.4779284,12.85868,0.638522,  
0.6018211,13.25208,0.676287,  
0.4356969,13.67813,0.605735,  
0.4238942,13.81275,0.61436,  
0.5069381,13.75151,0.633366,  
0.6001049,13.66419,0.650117,  
0.6608616,13.62121,0.625603,  
-0.652706,11.55017,0.490851,  
-0.626186,11.62157,0.473449,  
-0.4228269,11.68405,0.503013,  
-0.2337306,11.65092,0.512501,  
-0.1708536,12.27989,0.566782,  
-0.1591224,12.54861,0.558133,  
-0.0802962,12.62747,0.558799,  
0,12.76171,0.57207,  
0.181029,12.83356,0.624763,  
0.2931695,13.2069,0.628706,  
0.2823478,13.65693,0.58915,  
0.2219589,13.81871,0.532612,  
0.2265936,13.75574,0.526652,  
0.3161019,13.66065,0.540163,  
0.3291167,13.61872,0.528775,  
-1.337794,11.6851,0.524334,  
-1.322632,11.72641,0.537,  
-1.18403,11.71898,0.582119,  
-1.122129,11.78504,0.579489,  
-1.062167,12.3106,0.606592,  
-1.000986,12.53797,0.60727,  
-0.8917518,12.63318,0.582425,  
-0.8029107,12.78289,0.573972,  
-0.6169364,12.84347,0.654256,  
-0.6173313,13.2272,0.631055,  
-0.7593575,13.65337,0.56924,  
-0.7972996,13.831,0.589682,  
-0.757594,13.76895,0.587953,  
-0.7044164,13.6956,0.565388,  
-0.7066033,13.646,0.577078,  
-2.448849,11.65257,0.432066,  
-2.335728,11.69941,0.439669,  
-1.955456,11.71102,0.488932,  
-1.773635,11.75367,0.484181,  
-1.749821,12.25203,0.529925,  
-1.806232,12.48047,0.532723,
```

```
-1.766641,12.66579,0.549067,  
-1.726871,12.8038,0.55714,  
-1.648969,12.87245,0.611377,  
-1.416881,13.21289,0.645319,  
-1.360607,13.65348,0.611734,  
-1.387667,13.82662,0.580884,  
-1.294908,13.76625,0.572047,  
-0.9912001,13.68918,0.59457,  
-0.8641466,13.63083,0.585525,  
-2.975381,11.68032,0.442875,  
-2.944165,11.66327,0.462473,  
-2.876209,11.66008,0.519118,  
-2.703764,11.77045,0.529331,  
-2.65487,12.40191,0.557797,  
-2.604217,12.53512,0.556181,  
-2.465739,12.66752,0.569327,  
-2.348901,12.7905,0.583465,  
-2.121815,12.89337,0.631818,  
-1.896813,13.24754,0.604723,  
-1.937845,13.6511,0.587921,  
-1.776083,13.82123,0.616159,  
-1.755846,13.77284,0.605868,  
-1.678413,13.6796,0.594688,  
-1.545154,13.64664,0.635545,  
-3.278573,11.67089,0.448539,  
-3.22429,11.6904,0.475889,  
-3.116071,11.6621,0.500562,  
-2.990844,11.71992,0.500344,  
-2.899586,12.17721,0.528897,  
-2.947666,12.6376,0.495361,  
-2.865108,12.68725,0.510342,  
-2.788881,12.80238,0.518296,  
-2.673258,12.86469,0.546723,  
-2.377858,13.24435,0.554276,  
-2.183558,13.68177,0.517766,  
-1.869803,13.82859,0.580049,  
-1.679533,13.74345,0.556024,  
-1.398987,13.65496,0.537791,  
-1.190685,13.61642,0.525775),
```

```
nrow=90,  
byrow=TRUE,  
dimnames=list(1:90))
```

```
Y <-
```

```
matrix(c(13.9471,  
14.01082,  
14.08521,  
14.22863,  
14.33236,  
14.4164,  
14.52004,  
14.65482,  
14.78597,  
14.99343,  
15.14728,
```

15.16818,
15.20081,
15.27014,
15.3733,
13.25215,
13.37018,
13.56404,
13.8148,
14.00113,
14.1216,
14.22188,
14.35158,
14.52128,
14.75096,
14.95901,
15.08463,
15.12863,
15.19235,
15.25283,
12.56479,
12.64203,
12.74273,
12.8336,
13.01709,
13.14297,
13.26273,
13.41403,
13.57191,
13.72546,
13.85619,
13.934,
13.90724,
13.99694,
13.97292,
11.88564,
12.04468,
12.41919,
12.64236,
12.77801,
12.83185,
12.95019,
13.069,
13.18551,
13.42509,
13.68818,
13.86622,
13.99255,
14.08048,
14.17805,
11.42257,
11.46613,
11.49463,
11.66106,
11.83777,

-0.6173313,
-0.7593575,
-0.7972996,
-0.757594,
-0.7044164,
-0.7066033,
-2.448849,
-2.335728,
-1.955456,
-1.773635,
-1.749821,
-1.806232,
-1.766641,
-1.726871,
-1.648969,
-1.416881,
-1.360607,
-1.387667,
-1.294908,
-0.9912001,
-0.8641466,
-2.975381,
-2.944165,
-2.876209,
-2.703764,
-2.65487,
-2.604217,
-2.465739,
-2.348901,
-2.121815,
-1.896813,
-1.937845,
-1.776083,
-1.755846,
-1.678413,
-1.545154,
-3.278573,
-3.22429,
-3.116071,
-2.990844,
-2.899586,
-2.947666,
-2.865108,
-2.788881,
-2.673258,
-2.377858,
-2.183558,
-1.869803,
-1.679533,
-1.398987,
-1.190685),

nrow=90,
byrow=TRUE,
dimnames=list(1:90))

```
X2 <-  
matrix (c(11.57731,  
11.61102,  
11.61344,  
11.71156,  
12.18896,  
12.48978,  
12.48162,  
12.6648,  
12.85868,  
13.25208,  
13.67813,  
13.81275,  
13.75151,  
13.66419,  
13.62121,  
11.55017,  
11.62157,  
11.68405,  
11.65092,  
12.27989,  
12.54861,  
12.62747,  
12.76171,  
12.83356,  
13.2069,  
13.65693,  
13.81871,  
13.75574,  
13.66065,  
13.61872,  
11.6851,  
11.72641,  
11.71898,  
11.78504,  
12.3106,  
12.53797,  
12.63318,  
12.78289,  
12.84347,  
13.2272,  
13.65337,  
13.831,  
13.76895,  
13.6956,  
13.646,  
11.65257,  
11.69941,  
11.71102,  
11.75367,  
12.25203,  
12.48047,  
12.66579,  
12.8038,
```


12.87245,
13.21289,
13.65348,
13.82662,
13.76625,
13.68918,
13.63083,
11.68032,
11.66327,
11.66008,
11.77045,
12.40191,
12.53512,
12.66752,
12.7905,
12.89337,
13.24754,
13.6511,
13.82123,
13.77284,
13.6796,
13.64664,
11.67089,
11.6904,
11.6621,
11.71992,
12.17721,
12.6376,
12.68725,
12.80238,
12.86469,
13.24435,
13.68177,
13.82859,
13.74345,
13.65496,
13.61642),

```
nrow=90,  
byrow=TRUE,  
dimnames=list(1:90))  
X3 <-  
matrix(c(0.534487,  
0.532328,  
0.547736,  
0.540846,  
0.591167,  
0.575417,  
0.594495,  
0.597409,  
0.638522,  
0.676287,  
0.605735,  
0.61436,  
0.633366,
```

0.650117,
0.625603,
0.490851,
0.473449,
0.503013,
0.512501,
0.566782,
0.558133,
0.558799,
0.57207,
0.624763,
0.628706,
0.58915,
0.532612,
0.526652,
0.540163,
0.528775,
0.524334,
0.537,
0.582119,
0.579489,
0.606592,
0.60727,
0.582425,
0.573972,
0.654256,
0.631055,
0.56924,
0.589682,
0.587953,
0.565388,
0.577078,
0.432066,
0.439669,
0.488932,
0.484181,
0.529925,
0.532723,
0.549067,
0.55714,
0.611377,
0.645319,
0.611734,
0.580884,
0.572047,
0.59457,
0.585525,
0.442875,
0.462473,
0.519118,
0.529331,
0.557797,
0.556181,
0.569327,

```
0.583465,  
0.631818,  
0.604723,  
0.587921,  
0.616159,  
0.605868,  
0.594688,  
0.635545,  
0.448539,  
0.475889,  
0.500562,  
0.500344,  
0.528897,  
0.495361,  
0.510342,  
0.518296,  
0.546723,  
0.554276,  
0.517766,  
0.580049,  
0.556024,  
0.537791,  
0.525775),
```

```
nrow=90,  
byrow=TRUE,  
dimnames=list(1:90))  
V <- cov(X)  
p1=t(X)%*%Z  
p1  
p2=t(p1)%*%solve(V)  
p2  
p3=t(p2)%*%t(Z)%*%X  
p3  
p4=solve(p3)  
p4  
p5=p4%*%t(p2)%*%t(Z)%*%Y  
p5  
X1_hat = 0.7708356*X1  
X1_hat  
X2_hat = 1.0743491*X2  
X2_hat  
X3_hat = 0.9653712*X3  
X3_hat  
Y_hat = X1_hat + X2_hat + X3_hat  
Y_hat
```

Pendugaan FGLS menggunakan program SAS 9.0

```
data var_trans;
input y x1 x2 x3;
datalines;
1.8967 1.695779 0.240937 0.067961
1.872087 1.686131 0.242867 0.058034
1.802852 1.625124 0.239183 0.037641
1.778645 1.568445 0.281789 0.029905
1.724236 1.51068 0.2365 0.042154
1.707182 1.517337 0.274445 0.035509
1.699316 1.52391 0.179694 0.048194
1.698496 1.521251 0.225952 0.044955
1.667668 1.517451 0.328879 0.036526
1.644453 1.480897 0.361039 0.068948
1.592377 1.332542 0.367543 0.040422
1.470454 1.265804 0.345615 0.043818
1.436283 1.278922 0.346103 0.067994
1.401598 1.226351 0.342335 0.084614
1.421512 1.199393 0.34228 0.060817
1.20175 1.091468 0.213797 0.024325
1.231447 1.073276 0.253417 -0.00084
1.281682 1.114304 0.309793 -0.00708
1.364815 1.172782 0.221149 0.00156
1.393006 1.19126 0.32743 0.017769
1.412382 1.198003 0.333275 0.018225
1.401156 1.188576 0.325544 0.012498
1.395256 1.191466 0.322862 0.019616
1.402978 1.220552 0.303759 0.022767
1.401983 1.172246 0.315859 0.021367
1.404107 1.179193 0.346343 0.023837
1.386904 1.063869 0.351575 -0.03793
1.364103 0.998577 0.350333 -0.03872
1.323808 0.942348 0.338795 -0.02534
1.301042 0.867649 0.33979 -0.03601
0.51439 0.40638 0.348727 0.057808
0.503297 0.37683 0.358257 0.062891
0.460372 0.353101 0.344723 0.072024
0.383615 0.284384 0.355269 0.068548
0.408966 0.299946 0.35814 0.057579
0.433752 0.356139 0.322635 0.067362
0.442006 0.377121 0.331254 0.036124
0.457706 0.388555 0.344042 0.021518
0.453608 0.422586 0.313669 0.05226
0.376483 0.261745 0.336159 0.023716
0.301287 0.137487 0.342783 0.003927
0.236274 0.04461 0.363865 0.01914
0.142713 0.01439 0.363543 0.022581
0.128398 -0.07817 0.373745 -0.00012
0.021132 -0.16807 0.36707 0.012292
-0.16476 -0.70467 0.316197 -0.03446
-0.09405 -0.63627 0.331257 -0.03462
0.136832 -0.41832 0.336763 -0.02116
0.192375 -0.36712 0.323899 -0.02676
0.169886 -0.38771 0.29957 -0.01909
0.122632 -0.44911 0.265135 -0.00718
0.129466 -0.49777 0.363864 0.002766
0.112676 -0.53541 0.364952 0.004686
0.067208 -0.60945 0.342649 0.009381
0.076113 -0.5378 0.321849 0.03798
0.133277 -0.46376 0.342893 0.046421
0.168494 -0.54576 0.359485 0.010342
0.228023 -0.52292 0.360843 0.006675
0.211938 -0.36495 0.367325 0.029067
```

0.226262	-0.32561	0.3519	0.020739
-0.62783	-1.23121	0.343947	-0.02365
-0.6726	-1.2447	0.295117	-0.01182
-0.78773	-1.33908	0.285823	0.009023
-0.78892	-1.29725	0.340679	0.01839
-0.77035	-1.29276	0.44945	0.008784
-0.75015	-1.24709	0.319785	0.016273
-0.70256	-1.19687	0.365594	0.023026
-0.70045	-1.15744	0.351652	0.031011
-0.59733	-1.08229	0.363569	0.029822
-0.56373	-1.01774	0.356499	-0.00262
-0.57792	-1.041	0.340513	0.022608
-0.52792	-0.93417	0.354095	0.045617
-0.58216	-0.98386	0.367433	0.040496
-0.59526	-1.05217	0.357745	0.029185
-0.63015	-1.00662	0.36771	0.070759
-0.90886	-1.5344	0.334517	-0.01799
-0.91477	-1.52483	0.322247	0.001595
-0.94583	-1.57894	0.287843	-0.00953
-0.95575	-1.58433	0.290149	-0.0106
-0.92588	-1.53747	0.22475	-0.02012
-0.90991	-1.59054	0.422265	-0.04455
-0.9358	-1.59624	0.385324	-0.03596
-0.90859	-1.59742	0.363532	-0.03416
-0.91335	-1.63374	0.334889	-0.05527
-0.81794	-1.49878	0.353309	-0.05306
-0.70309	-1.28671	0.371183	-0.04755
-0.56153	-1.02789	0.361455	0.009507
-0.40569	-0.90755	0.338043	-0.00935
-0.2707	-0.77274	0.333105	-0.02771
-0.12682	-0.65215	0.33749	-0.03901

;

```
proc reg data=var_trans ;
```

```
model y=x1 x2 x3/noint;
```

```
run;
```